OLYMPUS®

INSTRUCTIONS

EVIS EXERA II

EVIS EXERA II XENON LIGHT SOURCE

OLYMPUS CLV-180

CE 0197

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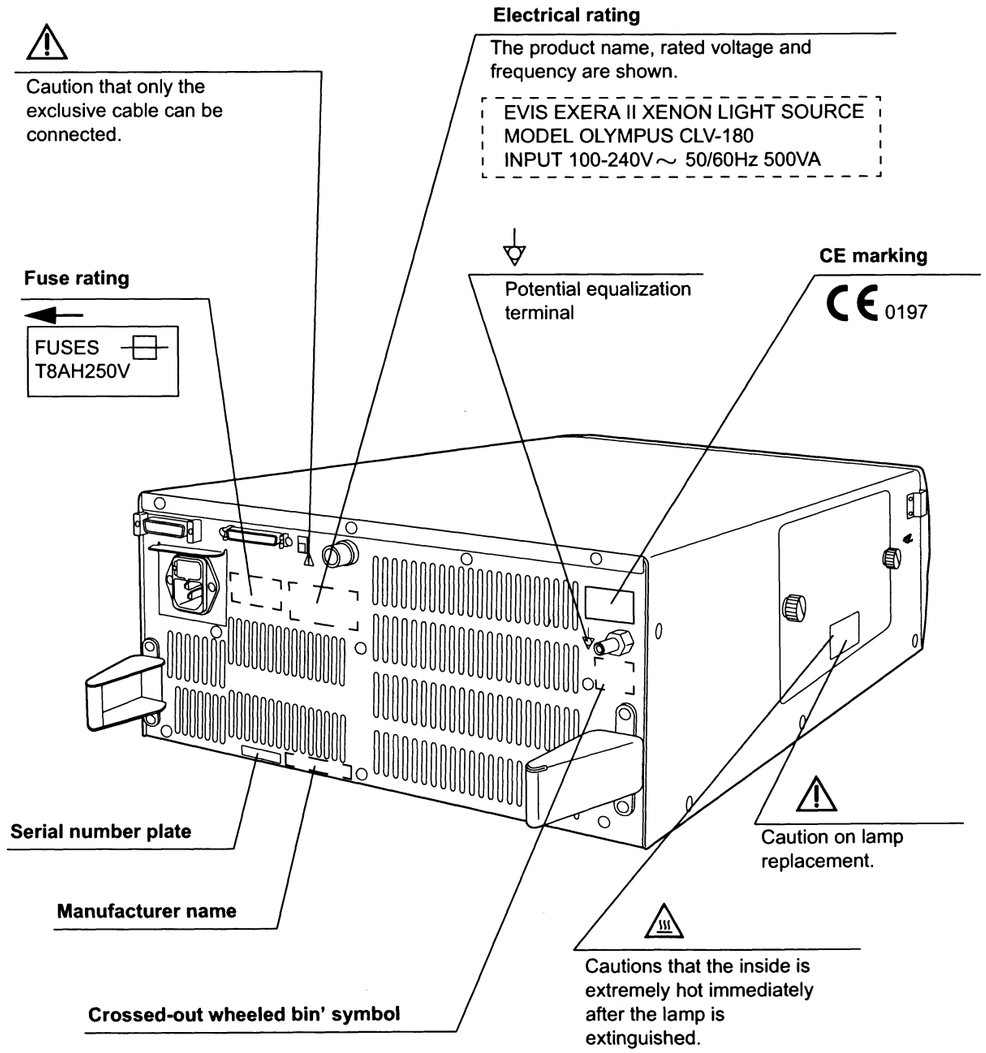
Labels and Symbols

Safety-related labels and symbols are attached to the light source at the locations shown below. If labels or symbols are missing or illegible, contact Olympus.

O Rear side


Caution that only the exclusive cable can be connected.
Electrical rating
The product name, rated voltage and frequency are shown.
EVIS EXERA II XENON LIGHT SOURCE
MODEL OLYMPUS CLV-180
INPUT 100-240V~ 50/60Hz 500VA
Potential equalization terminal
CE marking
CE 0197
Fuse rating
FUSES
T8AH250V
Serial number plate
Manufacturer name
Crossed-out wheeled bin' symbol
Caution on lamp replacement.
Cautions that the inside is extremely hot immediately after the lamp is extinguished.

○ Back cover of this instruction manual

Manufacturer

Authorized representative in the European Community

Important Information — Please Read Before Use

Intended use

This light source has been designed to be used with Olympus endoscopes, video system center, and other ancillary equipment for endoscopic diagnosis, treatment and video observation.
Do not use this light source for any purpose other than its intended use.

Instruction manual

This instruction manual contains essential information on using this light source safely and effectively. Before use, thoroughly review this manual and the manuals of all equipment which will be used during the procedure and use the equipment as instructed.
Keep this and all related instruction manuals in a safe, accessible location.
If you have any questions or comments about any information in this manual, please contact Olympus.

○ Terms used in this manual

EVIS EXERA II video system center:

The EVIS EXERA II video system center is a device that converts signals from a videoscope or camera head into monitor images.

Camera head:

The camera head is a device that converts endoscopic images from a fiberscope or a rigidscope into monitor images.

Automatic brightness control:

The automatic brightness control automatically adjusts the intensity of the light emitted from the light source so that the endoscopic image will be maintained at constant brightness even if the distance between the distal end of the endoscope's insertion tube and the subject changes.

Mobile workstation:

The mobile workstation is a special trolley on which this light source is placed and used for endoscopic diagnosis and treatment.

Wall mains outlet:

The wall mains outlet is a wall AC mains power outlet socket with a terminal used exclusively for grounding.

Isolation transformer:

The isolation transformer is a safety device that is used to isolate non-insulated equipment with potentially high leakage currents to decrease the possibility of electric shock.

Transillumination function:

With this function, the distal end of the endoscope emits more intense examination light, which transmits through the body wall tissue of the patient and enables the operator to confirm the position of the distal end from outside the patient's body, provided that the operating room illumination is low. This function is available only with EVIS videoscopes and a few fiberscopes.

High intensity mode:

This mode emits brighter illumination light than usual. It is available only with the endoscopes and light guide cables compatible with this mode.

Special light observation:

This is an observation using specific filtered light (e.g. NBI).

NBI (Narrow Band Imaging) observation:

NBI observation mode utilizes an optical filter, which filters the white light spectrum, changing it from a broad band to a narrow band. The filter sets the narrow bands to specific wavelengths within the green and blue spectrum that are within the visible light spectrum.

User qualifications

If there is an official standard on user qualifications to perform endoscopy and endoscopic treatment that is defined by the medical administration or other official institutions, such as academic societies on endoscopy, follow that standard. If there is no official qualification standard, the operator of this instrument must be a physician approved by the medical safety manager of the hospital or person in charge of the department (department of internal medicine, etc.).

The physician should be capable of safely performing the planned endoscopy and endoscopic treatment following guidelines set by the academic societies on endoscopy, etc., and considering the difficulty of endoscopy and endoscopic treatment. This manual does not explain or discuss endoscopic procedures.

Instrument compatibility

Refer to the "System chart" in the Appendix to confirm that this light source is compatible with the ancillary equipment being used. Using incompatible equipment can result in patient injury or equipment damage and makes it impossible to obtain the expected functionality.
This instrument complies with the EMC standard for medical electrical equipment; edition 2 (IEC 60601-1-2: 2001). However, when connecting to an instrument that complies with the EMC standard for medical electrical equipment; edition 1 (IEC 60601-1-2: 1993), the whole system complies with edition 1.

Repair and modification

This light source does not contain any user-serviceable parts. Do not disassemble, modify or attempt to repair it; patient or user injury and/or equipment damage can result.
Some problems that appear to be malfunctions may be correctable by referring to Chapter 8, "Troubleshooting". If the problem cannot be resolved using the information in Chapter 8, contact Olympus.

Signal words

The following signal words are used throughout this manual:

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices or potential equipment damage.

NOTE

Indicates additional helpful information.

Dangers, warnings and cautions

Follow the dangers, warnings and cautions given below when handling this light source. This information is to be supplemented by the dangers, warnings and cautions given in each chapter.

DANGER

- Strictly observe the following precautions. Failure to do so may place the patient and medical personnel in danger of an electric shock.
  - When the light source is used to examine a patient, do not allow metal parts of the endoscope or its accessories to touch metal parts of other system components. Such contact may cause unintended current flow to the patient.
  - Keep fluids away from all electrical equipment. If fluids are spilled on or into the unit, stop operation of the light source immediately and contact Olympus.
  - Do not prepare, inspect or use this light source with wet hands.
- Never install and operate the light source in locations where:
  - The concentration of oxygen is high.
  - Oxidizing agents (such as nitrous oxide (N_2O)) are present in the atmosphere.
  - Flammable anesthetics are present in the atmosphere.

  Otherwise, explosion or fire may result because this light source is not explosion-proof.

WARNING

- In case of instrument failure or malfunction, always keep another light source in the room ready for use.
- Never insert anything into the ventilation grills of the light source. It can cause an electric shock and/or fire.
- Although the illumination light emitted from the endoscope's distal end is required for endoscopic observation and treatment, it may also cause alteration of living tissues such as protein denaturation of liver tissue and perforation of the intestines through inappropriate use.
  Observe the following warnings on the illumination.
  - Always set the minimum required brightness. The brightness of the image on a video monitor may differ from the actual brightness at the distal end of an endoscope. Especially in combination with endoscopes using an electrical shutter function, pay attention to the brightness level setting of this instrument. When this instrument is used with a video system center compatible with automatic brightness control function, be sure to use this function. The automatic brightness control can keep the illumination at a proper level. Refer to the instruction manual of the video system center for details.
  - Do not continue observation in the proximity to tissue or keep the distal end of the endoscope in contact with living tissue for a long time. It may cause patient burns.
  - When discontinuing the use of the endoscope, be sure to turn this instrument OFF or extinguish the examination lamp by pushing the lamp button.
- Do not look directly into the distal end of the endoscope, the distal end of the light guide cable or the output socket of the light source while the light source is ON. The intense light causes eye injury.
- Do not touch the distal end of the light guide connector of the endoscope, the distal end of the light guide cable or the output socket of the light source immediately after removing it from this instrument because they are extremely hot. Operator or patient injury can result.

Important Information — Please Read Before Use

- Xenon light sources produce significant heat due to the high intensity light required for endoscopic procedures. If the disconnected end of the light guide cable or the distal end of an endoscope touches operating room drapes or other flammable materials, fire can result.
  Observe the following warnings:
  - Never place the unattached end of an illuminated light guide cable on an operating room drape or other flammable material.
  - Never allow the distal end of an illuminated endoscope to come in contact with operating room drapes or other flammable material.
  - Be sure to turn OFF the light source or extinguish the examination lamp whenever the light source is not used.
- This product may interfere with other medical electronic equipment used in combination with it. Before use, refer to the Appendix to confirm the compatibility of this instrument with all equipment to be used.
- Do not use this product in any place where it may be subject to strong electromagnetic radiation (for example, in the vicinity of a microwave therapeutic device, MRI, wireless set, short-wave therapeutic device, cellular/portable phone, etc.). This may impair the performance of the product.
- If the endoscopic image dims during use, blood, mucus or debris may adhere to the light guide on the distal end of the endoscope. Carefully withdraw the endoscope from the patient and remove the blood or mucus in order to obtain optimum illumination and to ensure the safety of the examination. If you continue to use the endoscope in such a condition, the distal end temperature may rise and cause mucosal burns. It may also cause patient and/or operator injury.
- Do not rely on the special light observation method alone for primary detection of lesions or for a decision regarding any potential diagnostic or therapeutic intervention.

- For reasons described below, do not rely on the NBI imaging modality alone for primary detection of lesions or to make a decision regarding any potential diagnostic or therapeutic intervention.
  - It has not been demonstrated to increase the yield or sensitivity of finding any specific mucosal lesion including colonic polyps or Barrett's esophagus.
  - It has not been demonstrated to aid in differentiating establishing the presence or absence of dysplasia or neoplastic changes within mucosa or mucosal lesions.

CAUTION

- Do not use a pointed or hard object to press the buttons on the front panel. This may damage the buttons.
- Avoid applying excessive force to the connectors, as this may damage the instrument.
- Do not leave the examination lamp ON when an endoscope is connected to the light source. The examination light reaches the maximum intensity and the endoscope's distal end becomes hot. In addition, smoke may also be produced if the debris attached to the distal end is heated.
- Avoid using this instrument in a dusty environment, as this may damage the instrument.
- Be sure that this instrument is not used adjacent to or stacked with other equipment (other than the components of this instrument or system) to avoid electromagnetic interference.
- Electromagnetic interference may occur to this instrument when it is placed near equipment marked with the following symbol or other portable and mobile RF communications equipment such as cellular phones. If radio interference occurs, mitigation measures may be necessary, such as reorienting or relocating this instrument or shielding the location.

NOTE

As defined by the international safety standard (IEC 60601-1), medical electrical equipment is classified into the following types: TYPE CF applied part (the instrument can safely be applied to any part of the body, including the heart), and TYPE B/BF applied part (the instrument can safely be applied to any organ except the heart). The part of the body that an endoscope or electrosurgical accessory can safely be applied to depends on the classification of the equipment to which the instruments are connected. Before beginning the procedure, check the current leakage classification type of each instrument to be used for the procedure. Classification types are clearly specified in the instruments' instruction manuals.

Symbol	Classification
	TYPE CF applied part
	TYPE BF applied part
	TYPE B applied part

Cardiac applications

DANGER

- Use only the devices listed in the "System chart" in the Appendix for endoscopic observation or treatment of the heart or areas near the heart. Other combinations of equipment may cause ventricular fibrillation or seriously affect the cardiac function of the patient.
- For cardiac applications, never support the endoscope with a metal surgical arm which is not electrically isolated from the ground. If not isolated, the endoscope will be connected to the ground through the surgical arm and bed, and will conduct unexpected leakage current which may seriously affect the cardiac function of the patient.
- The use of medical devices not specifically designed for cardiac applications may cause ventricular fibrillation or seriously affect the cardiac function of the patient. As specified by the international standard IEC 60601-1, any applied part" used for observation or treatment of the heart or areas near the heart must meet "TYPE CF applied part" requirements for low electrical leakage current. When using endoscopes for endoscopic cardiac applications, the applied part requirements include all devices directly connected to the endoscope, such as the light guide cable, camera head and telescope holder. Each of these devices must individually meet the "TYPE CF applied part" requirements for leakage current limits if they are to be used for cardiac applications.

NOTE

The OLYMPUS light guide cables and camera heads listed in the "System chart" in the Appendix (TYPE CF applied part) which are suitable for cardiac applications bear a ♥ mark.

Summary of the functions of the instrument

Some of the functions described below may be unavailable or restricted depending on the ancillary equipment used with this instrument. Refer to the instruction manuals for the light source and the required ancillary equipment for details.

Illuminating the operation

The light of the examination lamp built into this instrument is provided to the endoscope.
→ Section 4.3, "Turning the light source ON and igniting the examination lamp" on page 53

Adjusting the examination light

When this instrument is used in combination with the EVIS EXERA II video system center and a videoscope, the examination light intensity is adjusted automatically.
When this instrument is used in combination with a fiberscope, the examination light intensity has to be adjusted manually.
→ Section 4.4, "Brightness adjustment" on page 55

NBI observation

NBI observation is possible.
→ Section 4.8, "Using the NBI observation mode" on page 61

Selecting the high intensity mode

Brighter examination light is available by using an endoscope and light guide that are compatible with high intensity mode operation.
→ Section 4.7, "Using the high intensity mode" on page 60

Air and water feed

This instrument incorporates an air pump and exclusive water feed tank for use in feeding air and water from the nozzle at the endoscope's distal end to the body cavity and adjusting the air/water flow.
→ Section 4.5, "Adjusting air/water pressure" on page 58

Transillumination function

The endoscope's distal end emits the intense light. The light transmits through the patient's body wall so the operator can confirm the position of the distal end from outside the patient's body provided that the operating room illumination is low.
→ Section 4.6, "Using the transillumination function" on page 59

Monitoring the operating hours of examination lamp

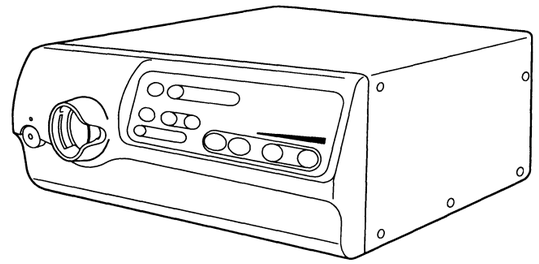
The lamp hour indicator on the front panel of this instrument displays the total accumulated operating hours of the examination lamp to indicate the time for replacement.
→ Section 3.4, "Checking the lamp hour indicator" on page 30

Automatic switching to emergency lamp

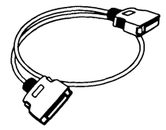
If the examination lamp does not light or blows in the middle of an examination making endoscopic observation impossible, the light source switches automatically to the emergency light. The emergency light provides enough brightness for withdrawing the endoscope from the patient's body.
→ Section 3.3, "Inspection of the power supply" on page 27 and Section 3.5, "Inspection of the examination light" on page 31

Chapter 1 Checking the Package Contents

Match all items in the package with the components shown below. Inspect each item for damage. If the light source is damaged, a component is missing or you have any questions, do not use the light source; immediately contact Olympus.

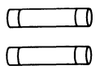


EVIS EXERA II xenon light source (CLV-180)

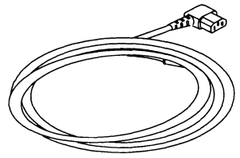


Light source cable (MAJ-1411)

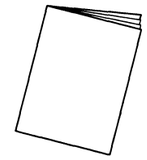
Foot holder (MAJ-1205, 4 pcs.)



Spare fuse (MAJ-1412, 2 pcs.)



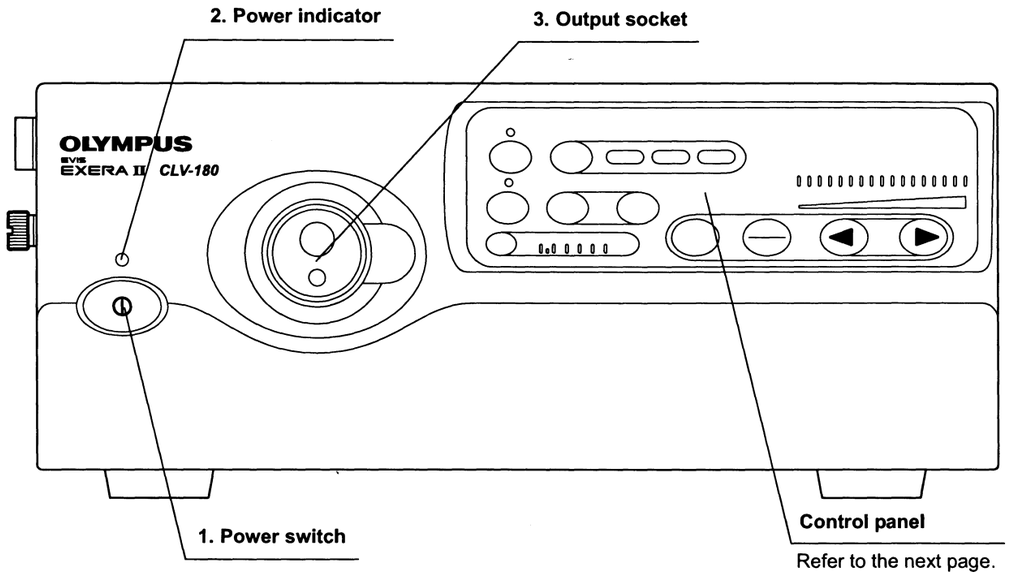
Power cord



Instruction manual

Chapter 2 Nomenclature and Functions

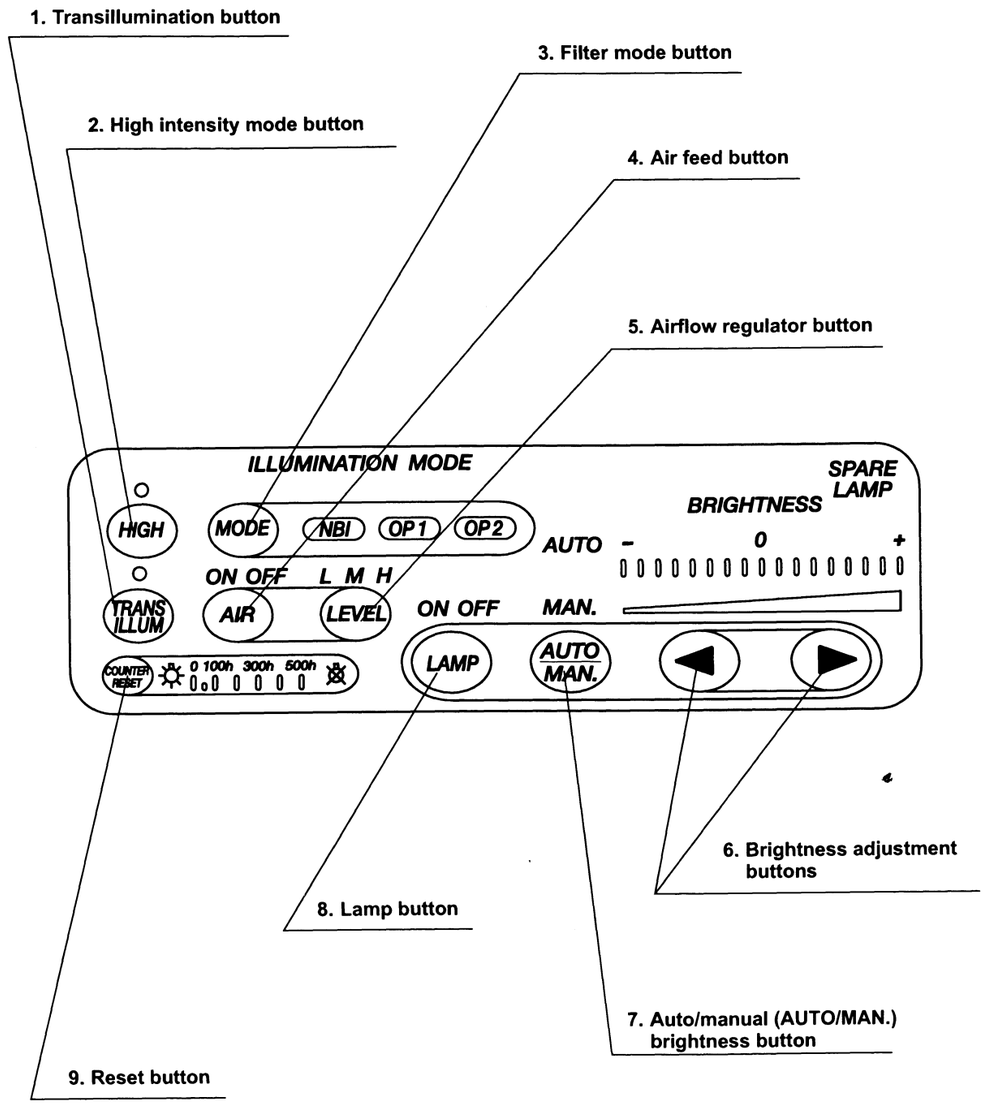
2.1 Front panel



Refer to the next page.

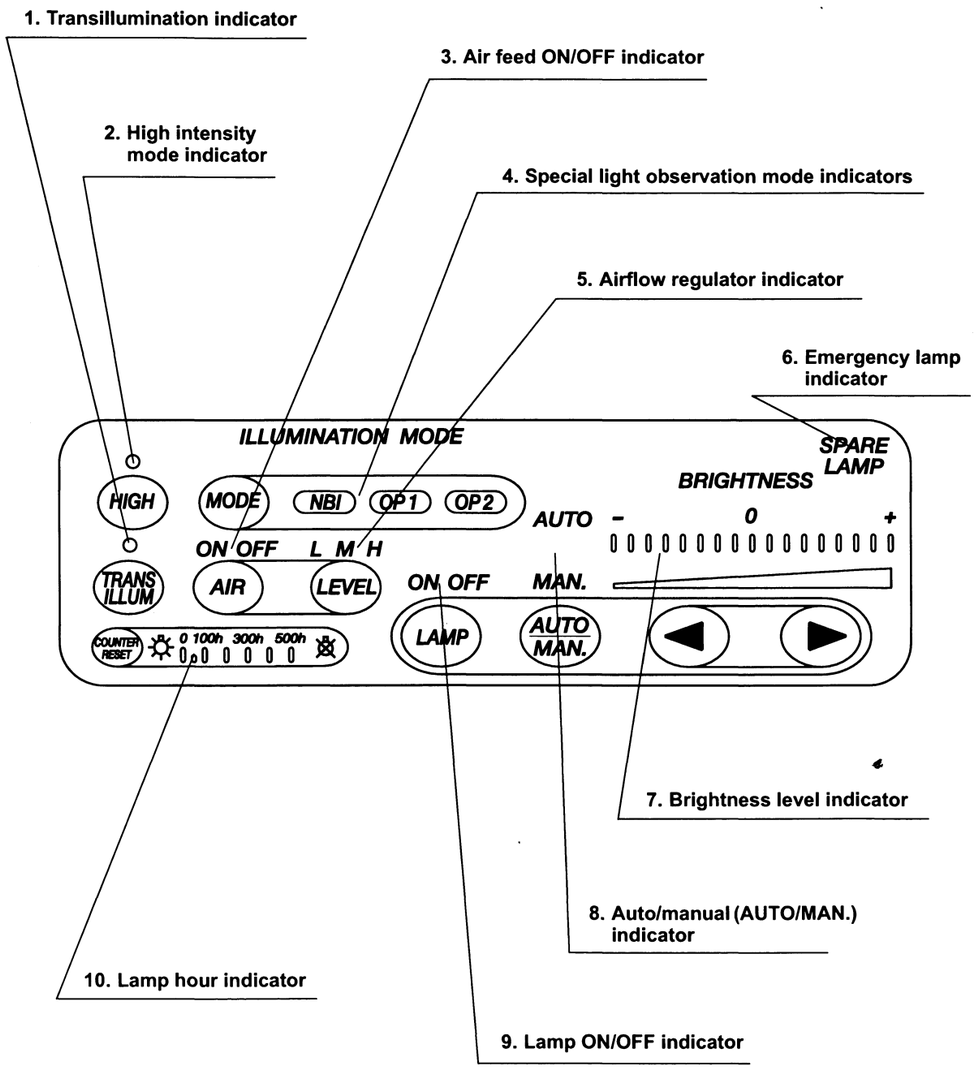
1. **Power switch**
   Press to turn the light source ON or OFF.
2. **Power indicator**
   Lights up when the light source is ON.
3. **Output socket**
   This socket provides light and air to the endoscope.

○ Control panel (buttons)



1. **Transillumination button**
   When this buttonis pressed, light emitted from the endoscope's distal end becomes brighter for 7 seconds, then returns automatically to its original brightness level.
   → Section 4.6, "Using the transillumination function" on page 59
2. **High intensity mode button**
   Press to switch between the high intensity mode and normal intensity mode when using an endoscope compatible with the high intensity mode.
   → Section 4.7, "Using the high intensity mode" on page 60
3. **Filter mode button**
   Pressing this button activates the NBI observation function.
   → Section 4.8, "Using the NBI observation mode" on page 61
4. **Air feed button**
   Pressing this button starts or stops air feeding from the endoscope's distal end.
   → Section 4.5, "Adjusting air/water pressure" on page 58
5. **Airflow regulator button**
   This button is used to control the air pressure being fed from the endoscope.
   → Section 4.5, "Adjusting air/water pressure" on page 58
6. **Brightness adjustment buttons**
   These buttons are pressed to adjust the brightness level.
   → Section 4.4, "Brightness adjustment" on page 55
7. **Auto/manual (AUTO/MAN.) brightness button**
   This button is pressed to select automatic or manual brightness control.
   → Section 4.4, "Brightness adjustment" on page 55
8. **Lamp button**
   This button is pressed to turn ON or OFF the examination (xenon) lamp.
   → Section 4.3, "Turning the light source ON and igniting the examination lamp" on page 53
   → Section 4.9, "Extinguishing the examination lamp" on page 63
9. **Reset button**
   After replacing the examination (xenon) lamp, the lamp hour indicator is reset by pressing this button for at least 3 seconds.
   → "Lamp hour indicator reset" on page 71

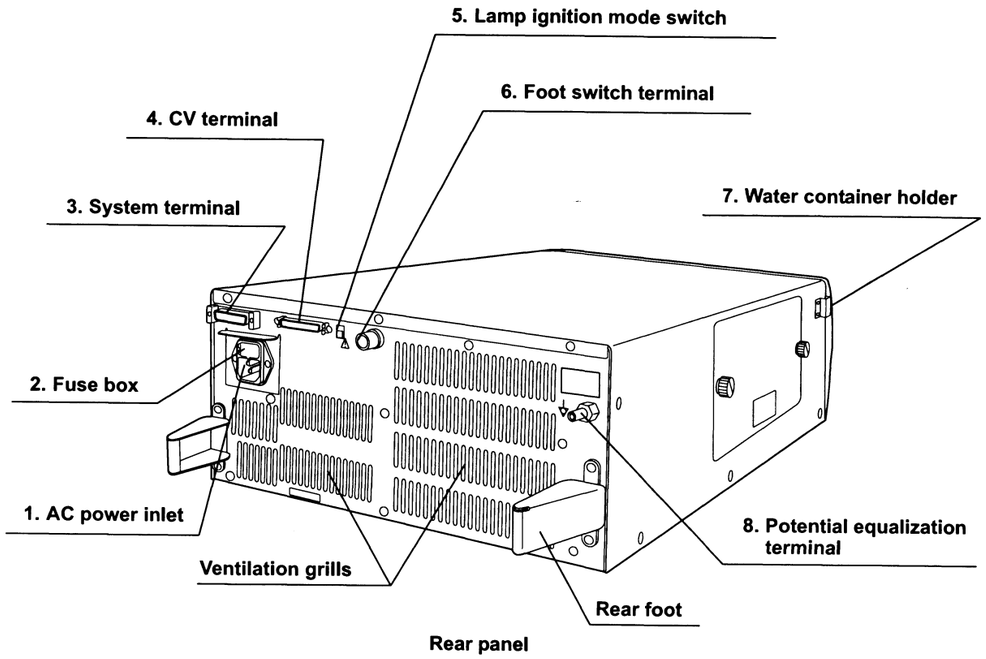
Control panel (indicators)

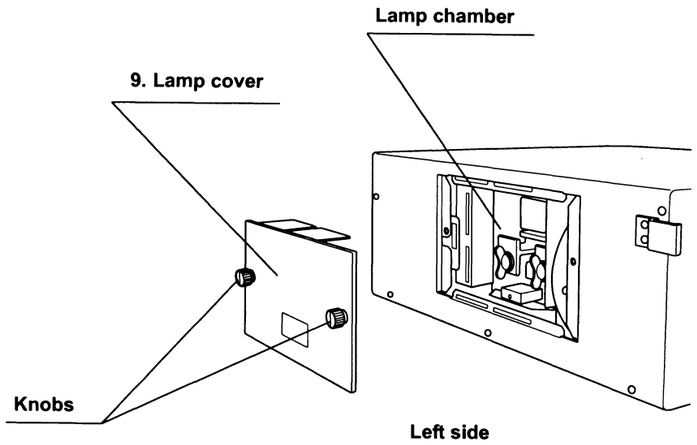


1. **Transillumination indicator**
   This indicator lights when the transillumination function is activated.
   → Section 4.6, “Using the transillumination function” on page 59
2. **High intensity mode indicator**
   This indicator lights when high intensity mode is selected.
   → Section 4.7, “Using the high intensity mode” on page 60
3. **Air feed ON/OFF indicator**
   These indicators display whether the air feeding function is activated (“ON”) or not (“OFF”).
   → Section 4.5, “Adjusting air/water pressure” on page 58
4. **Special light observation mode indicators**
   This indicator lights in green to indicate that the light source can perform the special light observation and turns white when the special light observation mode is active.
   “NBI” shows the NBI observation. The “OP.1” and “OP.2” indicators are reserved for future system expansion.
   → Section 4.8, “Using the NBI observation mode” on page 61
5. **Airflow regulator indicator**
   These indicators display the current airflow pressure level setting (“L” (low), “M” (medium) or “H” (high)).
   → Section 4.5, “Adjusting air/water pressure” on page 58
6. **Emergency lamp indicator**
   This indicator lights when the emergency lamp (halogen) is in use, and blinks when the emergency lamp (halogen) is disconnected or not mounted.
   → Section 3.3, “Inspection of the power supply” on page 27
   → Section 3.5, “Inspection of the examination light” on page 31
7. **Brightness level indicator**
   These indicators display the current brightness level.
   → Section 4.4, “Brightness adjustment” on page 55
8. **Auto/manual (AUTO/MAN.) indicator**
   This indicator displays the brightness adjustment setting (“AUTO” or “MAN.”).
   → Section 4.4, “Brightness adjustment” on page 55
9. **Lamp ON/OFF indicator**
   These indicators display whether the examination lamp (xenon lamp) lights (“ON”) or not (“OFF”).
   → Section 4.3, “Turning the light source ON and igniting the examination lamp” on page 53
   → Section 4.9, “Extinguishing the examination lamp” on page 63

10. **Lamp hour indicator**
    This indicator displays the total working hours of the examination (xenon) lamp.
    → Section 3.4, “Checking the lamp hour indicator” on page 30

2.2 Rear and side panels





1. **AC power inlet**
   Connect the provided power cord to supply the AC power via this inlet.
2. **Fuse box**
   The fuses protect the light source from electrical surges.
   → Section 5.2, “Fuse replacement” on page 72
3. **System terminal**
   The terminal is the receptacle for the communication cable (MAJ-202) for use with the endoscopic surgical system.
4. **CV terminal**
   This terminal is the receptacle for the light source cable to connect the light source to the EVIS EXERA II video system center.
   → Section 7.5, “Connection of the video system center” on page 84
5. **Lamp ignition mode switch**
   This selector is set to automatic or manual ignition of the examination lamp. When the automatic ignition is selected, turning ON the light source lights the examination lamp simultaneously. When the manual ignition is selected, pushing the lamp button on the control panel lights the examination lamp.
   → Section 7.3, “Selecting the lamp ignition mode” on page 81
6. **Foot switch terminal**
   (Unavailable)
7. **Water container holder**
   This holder is used for the installation of the water container.
   → Section 7.4, “Installation of the water container” on page 83
8. **Potential equalization terminal**
   This terminal is connected to a potential equalization terminal of the other equipment connected to this instrument. The electric potential of the equipment are made equal.
9. **Lamp cover**
   This cover has to be removed to replace the examination lamp.
   → “Removing the lamp” on page 66

Chapter 3 Inspection

WARNING

- Review Chapter 7, "Installation and Connection" thoroughly, and prepare the instruments properly before inspection. If the equipment is not properly prepared before each use, equipment damage, patient and operator injury and/or fire can occur.
- Before each procedure, inspect this light source as instructed below. Inspect other equipment to be used with this light source as instructed in their respective instruction manuals. Should any irregularity be observed, do not use the light source and see Chapter 8, "Troubleshooting". If the irregularity is still observed after consulting Chapter 8, contact Olympus. Damage or irregularity may cause electric shock, burns and/or fire.
- Do not leave the examination lamp ON before and/or after inspection. The distal end temperature of the endoscope may rise and cause patient and/or operator injury.

Inspect the light source and other equipment to be used with the light source. Refer to the respective instruction manuals for each piece of equipment.

3.1 Inspection work flow

Please see the inspection work flow in Figure 3.1 below. Follow each step of the work flow for inspection of the light source before use.

1. Check the lamp ignition mode.
→ Section 3.2, "Checking the lamp ignition mode" on page 27

↓

2. Confirm that the light source is turned ON normally.
→ Section 3.3, "Inspection of the power supply" on page 27

↓

3. Check the total accumulated operating hours of the examination lamp.
→ Section 3.4, "Checking the lamp hour indicator" on page 30

↓

4. Confirm that the examination lamp turns ON/OFF normally.
→ Section 3.5, "Inspection of the examination light" on page 31

↓

5. Confirm that the brightness of the examination light is adjustable.
→ Section 3.6, "Inspection of brightness adjustment" on page 33

↓

6. Inspect the necessary functions (available with the connected endoscope).

- High intensity mode
  → Section 3.7, "Inspection of the high intensity mode" on page 37
- Air/water feeding
  → Section 3.8, "Inspection of air and water feeding" on page 39
- Transillumination
  → Section 3.9, "Inspection of transillumination function" on page 41
- NBI observation
  → Section 3.10, "Inspection of the NBI observation function" on page 43

↓

continued on next page

7. After inspection

→ Section 3.11, "After inspection" on page 44

Turn the examination lamp OFF if the light source will not be used immediately.

Figure 3.1

3.2 Checking the lamp ignition mode

Check the lamp ignition mode set, manual ignition or auto ignition (refer to Section 7.3, "Selecting the lamp ignition mode" on page 81).
The factory default setting is the manual ignition.

3.3 Inspection of the power supply

WARNING

If the auto ignition is set, turning ON the light source ignites the examination lamp automatically. Do not look directly into the distal end of the endoscope or the output socket of the light source when they are emitting light. Eye injury may result.

1. Confirm that the ventilation grills on the bottom and rear panels of the light source are not covered with dust or other materials.
2. Confirm that the lamp cover is closed firmly.

NOTE

For safety reasons, a lamp cover that is not firmly closed will prevent the light source from being turned ON.

3. Press the power switch of the light source with no endoscope connected. The power indicator lights up (see Figure 3.2).

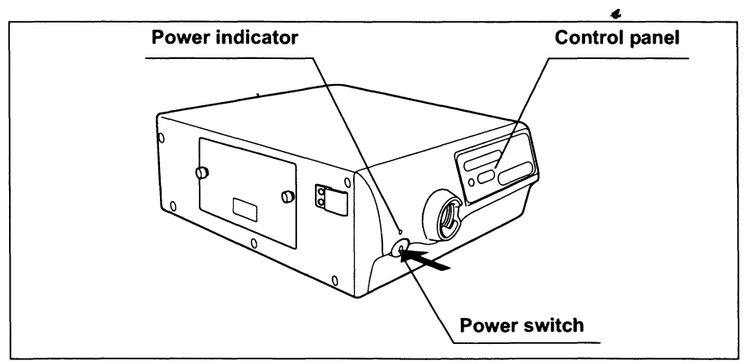


Figure 3.2

4. Confirm that the indicators on the control panel light up normally. If the indicators on the control panel blink, the light source is not working properly. Contact Olympus.

5. Press again the power switch to turn the light source OFF.

6. Connect an endoscope to the light source.

NOTE

Refer to Section 4.2, "Connection of an endoscope" on page 50 for connecting an endoscope.

7. Press the power switch of the light source. The power indicator lights up (see Figure 3.3).

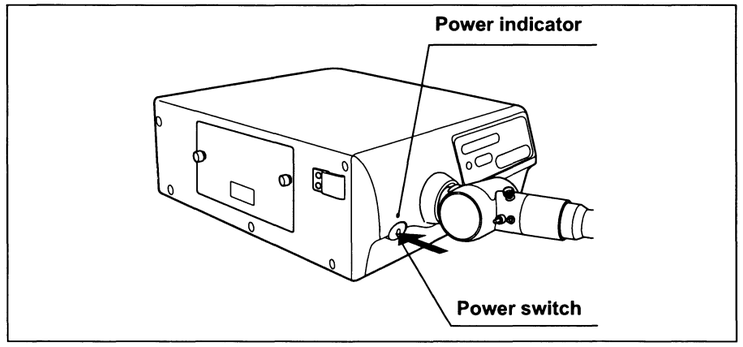


Figure 3.3

8. Confirm that air is exhausted by holding your hand in front of the ventilation grills on the rear panel.

WARNING

If the exhaust does not emit air, do not use the light source and contact Olympus.

O If the power fails to come ON

If the power fails to come ON, turn the light source OFF. Then, confirm that the power cord is connected firmly and that the lamp cover is firmly closed. Then, turn the light source ON again. If the power fails to come ON, replace the fuses with new ones as described in Section 5.2, "Fuse replacement" on page 72. If the power still fails to come ON, contact Olympus.

O If the emergency lamp indicator lights up

If the emergency lamp indicator lights up, turn the light source OFF and then ON again and try to ignite the examination lamp again. If the emergency lamp indicator still lights up, replace the examination lamp with a new one as described in Section 5.1, "Replacement of the examination (xenon) lamp" on page 64. If the emergency lamp indicator still lights up, contact Olympus.

NOTE

Pressing the lamp button when the examination lamp is OFF or turning the light source ON when the auto ignition is active automatically tries to ignite the examination lamp for 5 seconds. If ignition fails, the light source automatically switches to the emergency lamp and the emergency lamp indicator lights up.

O If the emergency lamp indicator blinks

If the emergency lamp indicator blinks, the installed emergency lamp is not working properly. Contact Olympus.

O If the indicators on the control panel blink

If the indicators on the control panel blink, the light source is not working properly. Contact Olympus.

3.4 Checking the lamp hour indicator

Check the lamp hour indicator.
When the "500 h" indicator on the lamp hour indicator lights up or when the lamp light intensity has lessened from when the lamp was new even if the indicator does not light up, replace the examination lamp with a new one as described in Section 5.1, "Replacement of the examination (xenon) lamp" on page 64 (see Figure 3.4).

NOTE

The lamp hour indicator displays the total working hours of the examination (xenon) lamp (e.g. "500 h" means 500 hours).

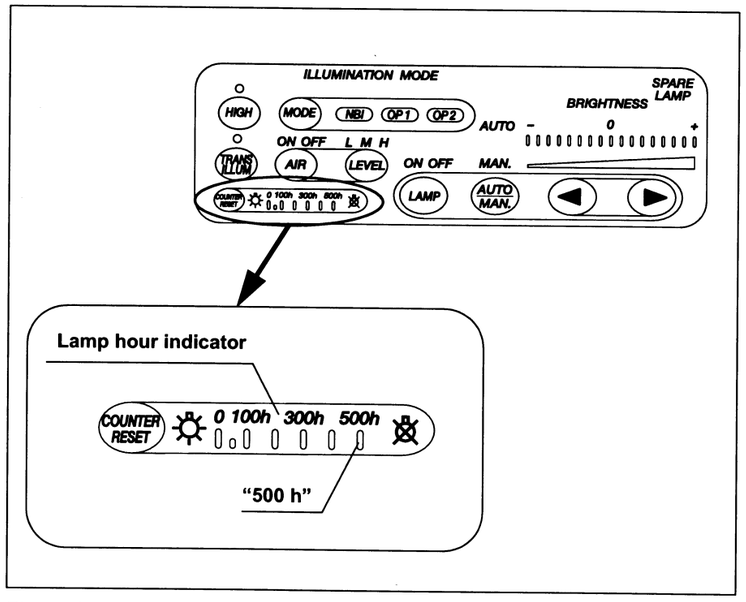


Figure 3.4

3.5 Inspection of the examination light

WARNING

Do not look directly into the distal end of the endoscope or the output socket of the light source when they are emitting light. Eye injury may result.

1. Press the lamp button if the examination lamp is OFF and confirm that the lamp ON indicator lights up (see Figure 3.5).

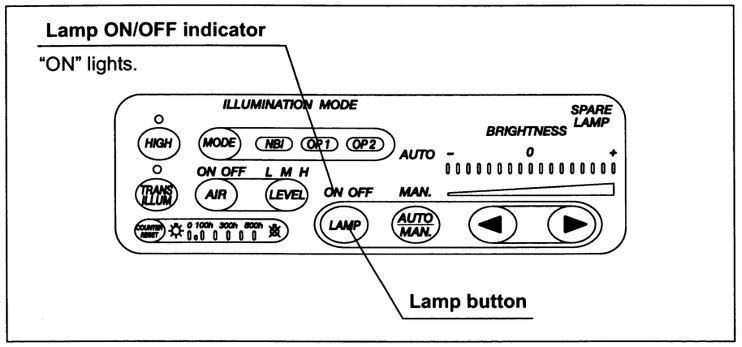


Figure 3.5

2. Confirm that the examination light is emitted from the distal end of the endoscope (see Figure 3.6).

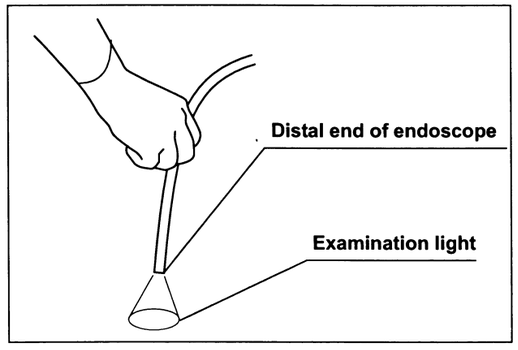


Figure 3.6

3. Press and hold the lamp button for one second. The lamp ON/OFF indicator is turned OFF.
4. Confirm that the examination light is not emitted from the distal end of the endoscope.

○ If the emergency lamp indicator lights up

If the emergency lamp indicator lights up, turn the light source OFF and then ON again and try to ignite the examination lamp again. If the emergency lamp indicator still lights up, replace the examination lamp with a new one as described in Section 5.1, "Replacement of the examination (xenon) lamp" on page 64.

NOTE

Pressing the lamp button when the examination lamp is OFF or turning the light source ON when the auto ignition is active automatically tries to ignite the examination lamp for 5 seconds. If ignition fails, the light source automatically switches to the emergency lamp and the emergency lamp indicator lights up.

3.6 Inspection of brightness adjustment

CAUTION

When using a fiberscope or a rigidscope without camera head, set the AUTO/MAN. brightness button to "MAN.". Setting to "AUTO" does not enable the automatic brightness adjustment, and the brightness may not be adequate.

Selecting automatic or manual brightness control

Press the AUTO/MAN. brightness button and confirm that the auto/manual modes are switched between "AUTO" and "MAN." with a short beep. Confirm that the "AUTO" indicator lights when the auto adjustment mode is selected and the "MAN." indicator lights when the manual adjustment mode is selected (see Figure 3.7).

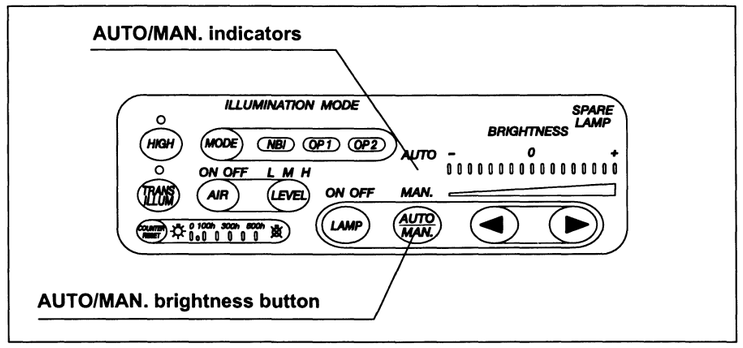


Figure 3.7

Automatic brightness adjustment

WARNING

When disconnecting the camera head from the endoscope without turning the lamp OFF, make sure that the brightness adjustment mode selector button is set to "MAN." and that the light intensity adjustment button is set to the minimum examination light intensity. If the camera head is disconnected while the brightness adjustment mode selector button is set to "AUTO", the intense light may cause eye injury.

Before inspection, connect the videoscope to the video system center, or connect the fiberscope or rigidscope with the camera head to the video system center.

1. Press the AUTO/MAN. brightness button and select "AUTO".

CAUTION

Turning OFF the video system center does not enable the automatic brightness adjustment. If this function is not activated, the brightness may be insufficient..

2. Point the distal end of the endoscope at a suitable object and vary the distance between 5 and 60 mm (see Figure 3.8). Confirm that the light being emitted from the distal end varies with the distance.

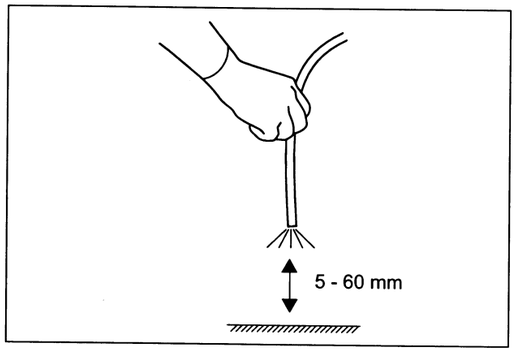


Figure 3.8

3. Hold the distal end of the endoscope at a distance between 30 and 40 mm to the object and press the brightness adjustment buttons ("◀" or "▶"). Confirm the following (see Figure 3.9):

- Each time either of the brightness adjustment buttons is pressed, a beep is heard and the brightness level increases or decreases accordingly. The present brightness level is indicated and the indicator moves one level up or down.
- When either of the brightness adjustment buttons is pressed continuously, successive beeps are heard and one of the brightness level indicator moves continuously.
- Each time either of the brightness adjustment buttons is pressed, the brightness of the endoscopic image increases or decreases.

NOTE

The brightness indication is interlocked with the brightness level indication of the video system center connected. When the brightness adjustment buttons on the video system center are pressed, the brightness indication on the light source changes accordingly.

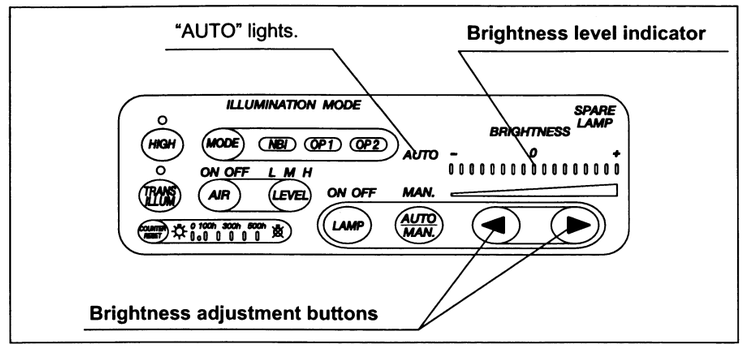


Figure 3.9

Manual brightness adjustment

When the light source is combined with a fiberscope or a rigidscope, perform the following inspection.

WARNING

When using manual brightness adjustment, always set the brightness to the minimum level necessary to complete the examination. If the light is too bright, eye injury or burns can result.

CAUTION

When switching the normal intensity mode to high intensity mode, be sure to set the brightness level to or below 0. Otherwise, the brightness will exceed the necessary level. It may result in operator and/or patient injury.

1. Press the AUTO/MAN. brightness button and select "MAN.".
2. Press the brightness adjustment buttons ("◀" or "▶") and confirm the following (see Figure 3.10):

- Each time either of the brightness adjustment buttons is pressed, a beep is heard and the brightness level increases or decreases accordingly. The present brightness level is indicated and the indicator moves one level up or down.
- When either of the brightness adjustment buttons is pressed down continuously, successive beeps are heard and one of the brightness level indicator moves continuously.
- The brightness of the light emitted from the distal end of the endoscope increases or decreases.

NOTE

The brightness indication is interlocked with the brightness level indication of the video system center connected. When the brightness adjustment buttons on the video system center are pressed, the brightness indication on the light source changes accordingly.

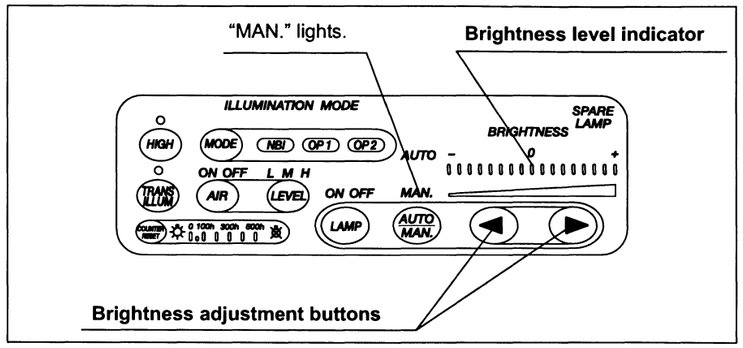


Figure 3.10

3.7 Inspection of the high intensity mode

NOTE

The high intensity mode is not available when no endoscope is connected to the light source. The function is available only when a compatible endoscope is connected.

1. Press the AUTO/MAN. brightness button and confirm that the "MAN." indicator lights (see Figure 3.11).
2. Press the brightness control buttons to set the brightness level to 0.
3. Connect an endoscope compatible with high intensity mode to the output socket on the light source.
4. Press the intensity mode button to change the normal mode to high intensity mode (see Figure 3.11).
5. Confirm that the high intensity mode indicator lights and the light emitted from the endoscope's distal end increases compared to the normal mode.
6. Press the intensity mode button to switch to the normal intensity mode.
7. Confirm that the high intensity mode indicator goes out and the light emitted from the endoscope's distal end decreases compared to the high intensity mode.
8. Press the intensity mode button again and confirm that the high intensity mode is restored.
9. Disconnect the endoscope. Confirm that the high intensity mode indicator still lights.
10. Turn the light source OFF.and turn it ON again. Confirm that the high intensity mode indicator lights.
11. Connect the endoscope compatible with the high intensity mode to the output socket on the light source again. Confirm that the high intensity mode indicator still lights.
12. Press the AUTO/MAN. brightness button and confirm that the "AUTO" indicator lights.

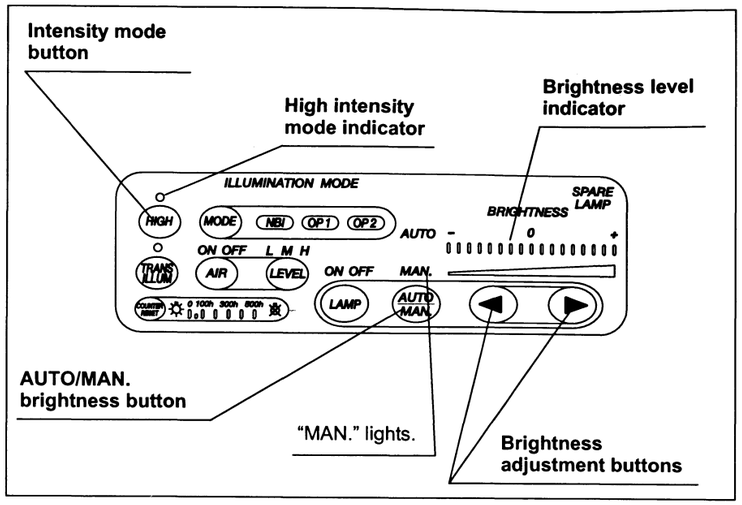


Figure 3.11

NOTE

- The following endoscopes and light guide cables are compatible with the high intensity mode:
  - Light guide cable
    A3290, A3291, A3292, A3293, A3294, A3295, A3296, A3297, A3298
  - Fiberscope
    CHF TYPE CB30L/S,
    URF TYPE P3
  - Videoscope
    LTF TYPE V3/VP,
    A50001A, A50003A, A50021A, A50023A,
    WA50***A series, WA50***L series
- This instrument includes a memory function for the intensity mode, which stores the intensity setting being used when the light source is turned OFF. Therefore, the user may start the next operation with the same setting used when the light source was turned OFF. The default setting of this function is normal intensity.

3.8 Inspection of air and water feeding

NOTE

The air and water feeding function is not available when no endoscope is connected to the light source. The function is available only when a compatible fiberscope or videoscope is connected.

When using a water container to feed water from the endoscope, inspect the air and water feeding functions as follows:

1. Confirm that the airflow "ON" indicator lights. If "OFF" lights, press the airflow button and confirm that a short beep is heard and the indicator lights up.
2. Then press the airflow regulator button repeatedly and confirm that the indication of the airflow regulator indicator is switched in the cycle of "L" (low), "M" (medium) and "H" (high) (see Figure 3.12).

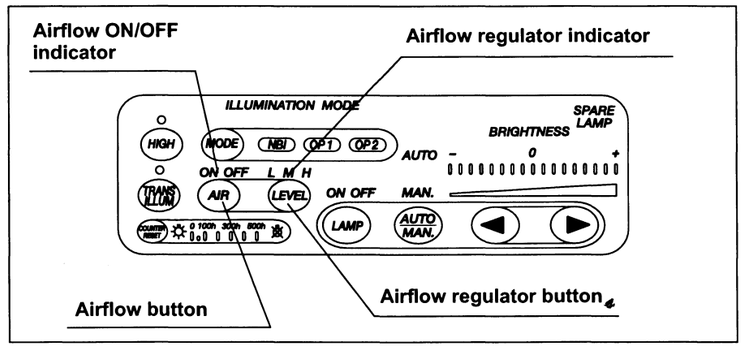


Figure 3.12

NOTE

- When the light source is turned OFF, the airflow regulator setting is automatically stored and recalled when the light source is turned ON again.
- The factory setting of the airflow level is "H" (high).

3. Set the airflow level to "H", immerse the distal end of the connected endoscope in sterile water and operate the endoscope's insufflation function following the instructions given in the endoscope's instruction manual.

4. Block the hole of the air/water valve so that air bubbles are emitted. Press the airflow button and confirm that the bubbles from the air/water nozzle stop (see Figure 3.13).

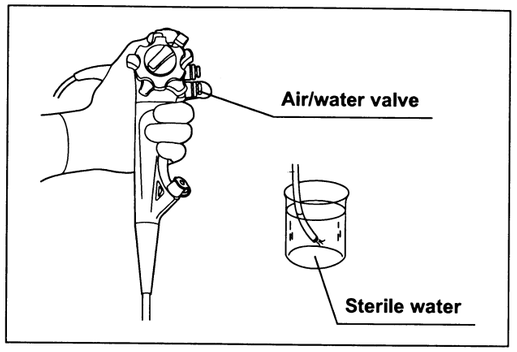


Figure 3.13

5. Block the hole of the air/water valve so that air bubbles are emitted. Press the airflow regulator button and confirm that the lighting airflow regulator indicator changes to the indicator for the higher level (except that the "L" level indicator lights after the "H" level indicator), and that the amount of bubbles from the air/water nozzle vary corresponding to the airflow level setting (see Figure 3.13).

6. Remove the distal end of the endoscope from the sterile water and operate the endoscope's water feeding function following the instructions given in the endoscope's instruction manual. Confirm that the amount of water emitted from the air/water nozzle varies corresponding to the airflow level setting (see Figure 3.13).

3.9 Inspection of transillumination function

WARNING

Do not use the transillumination function while looking through the eyepiece of a fiberscope. Otherwise, the maximum light intensity may injure your eyes.

NOTE

The transillumination function is not available when no endoscope is connected to the light source. The function is available only when a compatible fiberscope or videoscope is connected.

1. Press the transillumination button (see Figure 3.14).

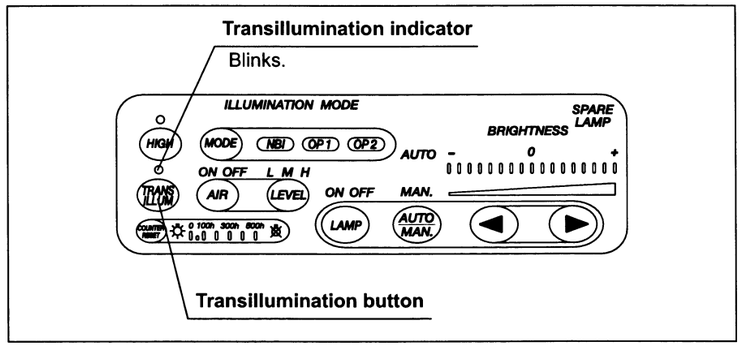


Figure 3.14

2. Confirm that:
   - A beep is heard.
   - The transillumination indicator on the front panel blinks.
   - Brightness is set to maximum for manual brightness control (see Figure 3.15).
   - After 7 seconds, the light returns to its original brightness.

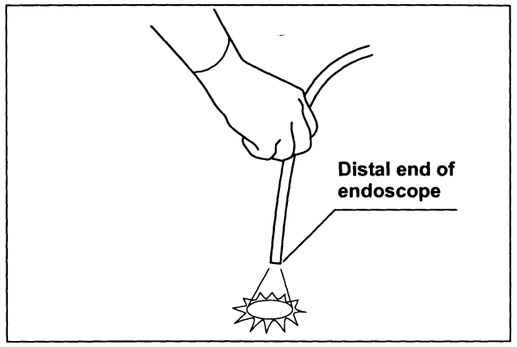


Figure 3.15

NOTE

- Pressing the transillumination button while the transillumination function is active cancels the function and returns to the original setting. Also, pressing any lighted button on the control panel cancels the transillumination function and the function returns to the original setting.
- The following endoscopes are compatible with the transillumination function:
  - EVIS series videoscope
  - OES 10/20/30/40 series
  - OES E/E3 series

3.10 Inspection of the NBI observation function

The conditions that must be present for NBI observation are as follows:

- The video system center is connected to the light source.
- An NBI compatible endoscope is connected to the light source and the video system center.
- The video system center is ON.

1. Confirm that the filter mode button lights and the "NBI" indicator lights in green (see Figure 3.16).
2. Press the filter mode button. The color of the "NBI" indicator turns white and the color of the examination light emitted from the endoscope' distal end is changed.

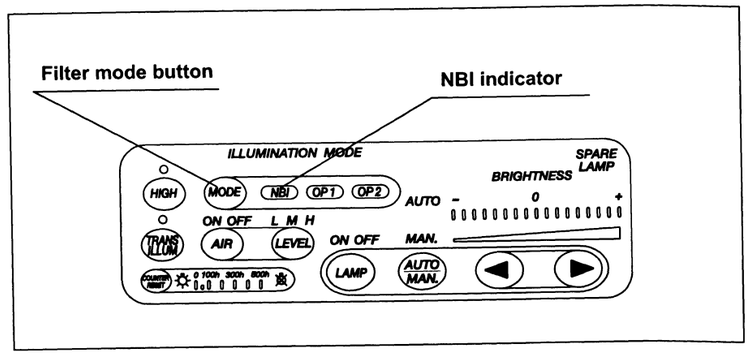


Figure 3.16

3.11 After inspection

After the inspection described on the previous pages, press the lamp button for one second to turn the examination lamp OFF if the light source will not be used immediately (see Figure 3.17).
If the light source will not be used for a while, turn the light source OFF (refer to Section 4.10, "Turning the light source OFF" on page 63).

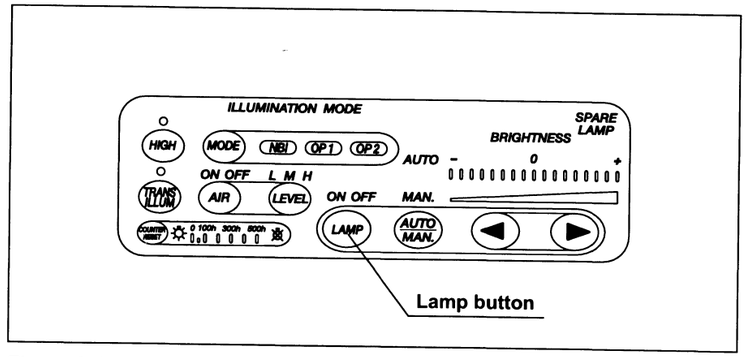


Figure 3.17

Chapter 4 Operation

This chapter explains the work flow of endoscopic observation using the light source.

The operator of this instrument must be a physician or medical personnel under the supervision of a physician and must have received sufficient training in clinical endoscopic technique. This manual, therefore, does not explain or discuss clinical endoscopic procedures. It only describes basic operation and precautions related to the operation of this instrument.

WARNING

- Be sure to wear protective equipment such as eye wear, face mask, moisture-resistant clothing and chemical-resistant gloves that fit properly and are long enough so that your skin is not exposed. Otherwise, dangerous chemicals and/or potentially infectious material such as blood and/or mucus of the patient may cause an infection.
- Should any irregularity be observed, do not use the light source. Damage or irregularity may cause electric shock, burns and/or fire.
- Anytime you observe an abnormality in a light source function, stop the examination immediately and take action according to the following procedures. Using a defective light source may cause patient and/or operator injury.
  After withdrawing the endoscope from the patient, refer to the instructions in Chapter 8, "Troubleshooting". If the problem cannot be resolved by the remedial action as described in Chapter 8, do not use this light source and immediately contact Olympus.
  - If the image on the monitor becomes completely white or black when the automatic brightness adjustment is selected, the automatic brightness adjustment may be malfunctioning. In this case, set the AUTO/MAN. brightness button to "MAN." and adjust the brightness manually. Withdraw the endoscope from the patient slowly as described in the endoscope's instruction manual.

  - If the examination lamp fails and the emergency lamp lights, withdraw the endoscope from the patient slowly as described in the endoscope's instruction manual.
  - If any other abnormality occurs or is suspected, stop using the equipment and immediately withdraw the endoscope from the patient slowly as described in the endoscope's instruction manual.
- Turn the light source OFF or extinguish the examination lamp while not using the light source. Leaving the examination lamp ON will cause the distal end of the endoscope to become hot and could cause operator and/or patient burns.
- Use only Olympus high-frequency electrosurgical equipment with this unit. Non-Olympus equipment can cause instability of the automatic brightness adjustment.
- Before using high-frequency electrosurgical equipment, make sure that the noise does not affect the observation and surgical procedures. If high-frequency electrosurgical equipment is used without such confirmation, patient injury may result.
- When using spray-type medical agents such as lubricant, anesthetic, or alcohol, use them away from the light source so that the medical agents do not contact the light source. Medical agents might enter the light source through the ventilation grills and may cause equipment damage.
- Do not use a humidifier near the light source as dew condensation possibly might occur and it may cause equipment failure.
- If the endoscopic image seems to be dark in the special light observation, change to the normal observation. Otherwise, the examination might not be performed safely.

NOTE

Set the brightness of the examination light to the minimum necessary to perform the procedure safely. If the endoscope is used for a prolonged period at or near maximum light intensity, vapor like smoke may be observed in the endoscopic image. This is caused by the evaporation of organic material (remaining blood, moisture of stool and so on) due to heat generated by the light guide near the light guide lens. If this vapor continues to interfere with the examination, remove the endoscope, wipe the distal end of the endoscope with a lint-free cloth moistened with 70% ethyl or isopropyl alcohol, reinsert the endoscope and continue the examination.

4.1 Operation flow

Please see the operation work flow in Figure 4.1 below. Follow each step of the work flow for using the light source.

1. Connect an endoscope.
→ Section 4.2, "Connection of an endoscope" on page 50

↓

2. Inspect the light source and the ancillary equipment.
→ Chapter 3, "Inspection" on page 24

↓

3. Turn the light source ON and ignite the examination lamp.
→ Section 4.3, "Turning the light source ON and igniting the examination lamp" on page 53

↓

4. Operate the light source (available with the connected endoscope).

- Adjusting the examination light
  → Section 4.4, "Brightness adjustment" on page 55
- Air and water feeding
  → Section 4.5, "Adjusting air/water pressure" on page 58
- Transillumination
  → Section 4.6, "Using the transillumination function" on page 59
- High intensity mode
  → Section 4.7, "Using the high intensity mode" on page 60
- NBI observation
  → Section 4.8, "Using the NBI observation mode" on page 61

↓

5. After examination, extinguish the examination lamp or turn the light source OFF.
→ Section 4.9, "Extinguishing the examination lamp" on page 63 or Section 4.10, "Turning the light source OFF" on page 63

↓

6. Disconnect the endoscope.

↓

continued on next page

7. Reprocess and store the instrument and ancillary equipment as appropriate after use.
→ Section 6.1, "Care" on page 74

Figure 4.1

4.2 Connection of an endoscope

WARNING

- Do not look directly into the distal end of the endoscope, the distal end of the light guide cable or the output socket of the light source while the light source is ON. The intense light may injure your eyes.
- Do not touch the distal end of the light guide connector of the endoscope, the distal end of the light guide cable or the output socket of the light source immediately after removing it from this instrument because they are extremely hot. Operator or patient injury can result.
- Xenon light sources produce significant heat due to the high intensity light required for endoscopic procedures. If the disconnected end of the light guide cable or the distal end of an endoscope touches operating room drapes or other flammable materials, fire can result.
  Observe the following warnings:
  - Never place the unattached end of an illuminated light guide cable on an operating room drape or other flammable material.
  - Never allow the distal end of an illuminated endoscope to come in contact with operating room drapes or other flammable material.
  - Be sure to turn OFF the light source or extinguish the examination lamp whenever the light source is not used.
- Before connecting the endoscope connector to the light source, make sure that it is completely dry. Otherwise, electric shock or equipment damage can result.

○ Connection of a rigidscope

WARNING

Connect equipment in the order described below. If connections are made in the wrong order, the light emitted from the distal end of the light guide cable may pose the following risks:

- Operator and/or patient injury.
- It may ignite flammable material such as an operating room drape, which can cause a fire.

1. Connect the light guide cable to the rigidscope.
2. Insert the light guide connector into the output socket on the front panel of the light source until it stops (see Figure 4.2).

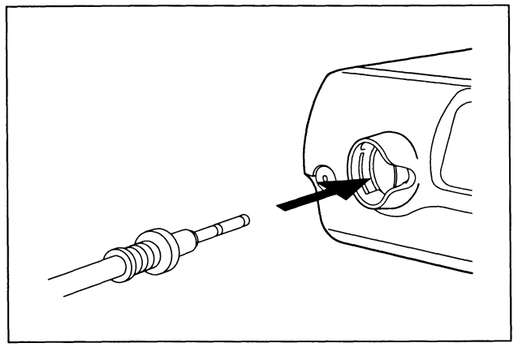
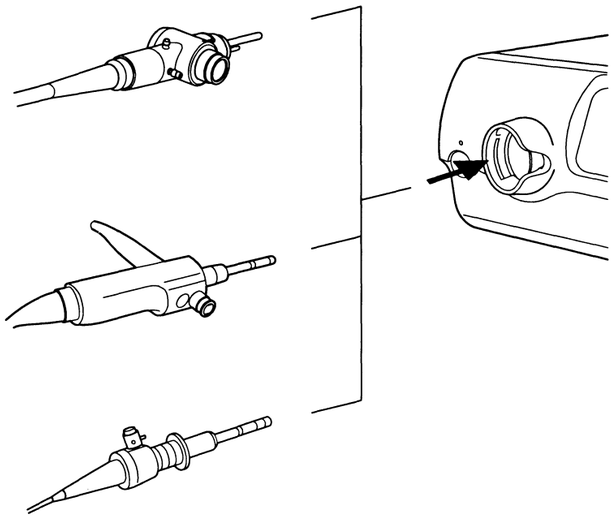


Figure 4.2

○ Connection of a flexible endoscope

Insert the endoscope connector or light guide connector into the output socket on the front panel of the light source until it stops (see Figure 4.3).



The connector design varies depending on the endoscope model.

Figure 4.3

4.3 Turning the light source ON and igniting the examination lamp

WARNING

When turning ON the light source, never allow the distal end of an endoscope or a light guide cable to come in contact with the patient, operating room drapes, and/or other flammable material. Patient injury and/or fire can result.

CAUTION

Be careful and avoid accidentally pressing the power switch or lamp button. Otherwise, the endoscopic image may suddenly darken.

1. Confirm that the endoscope connector is connected to the output socket of the light source.
2. Press the power switch of this instrument to turn it ON (see Figure 4.4). If the automatic ignition is selected, the examination lamp is turned ON. If the manual ignition is selected, pressing the lamp button turns the examination lamp ON. Confirm that the lamp "ON" indicator lights up (see Figure 4.5).

NOTE

The factory default setting is the manual ignition.

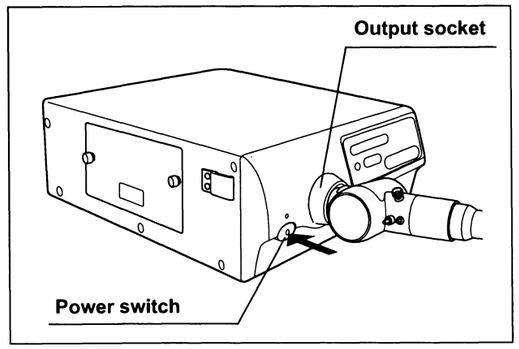


Figure 4.4

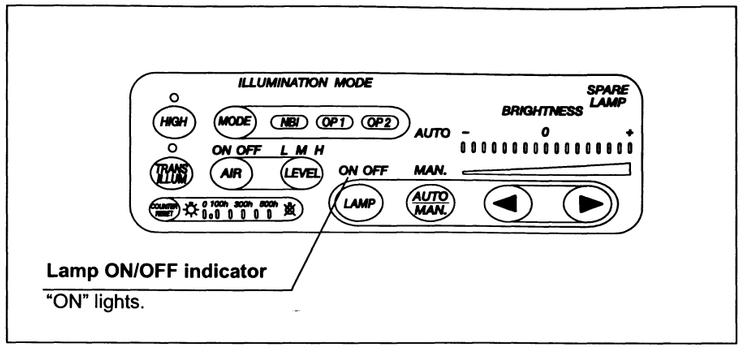


Figure 4.5

4.4 Brightness adjustment

WARNING

When using a fiberscope or a rigidscope without camera head, set the AUTO/MAN. brightness button to "MAN.". Setting to "AUTO" does not enable the automatic brightness adjustment, and the brightness may not be adequate.

CAUTION

When switching from the normal intensity mode to high intensity mode, be sure to set the brightness level to or below 0. Otherwise, the brightness will exceed the necessary level. It may result in operator and/or patient injury.

Automatic brightness adjustment

WARNING

When disconnecting the camera head from the endoscope without turning the lamp OFF, make sure that the brightness adjustment mode selector button is set to "MAN." and that the light intensity adjustment button is set to the minimum examination light intensity. If the camera head is disconnected while the brightness adjustment mode selector button is set to "AUTO", the intense light may injure your eyes.

CAUTION

Turn the video system center ON to enable the automatic brightness adjustment function of the light source. If the video system center is OFF, the automatic brightness adjustment is not enabled and the brightness may not be adequate.

1. Press the AUTO/MAN. brightness button to select the automatic brightness adjustment (see Figure 4.6).

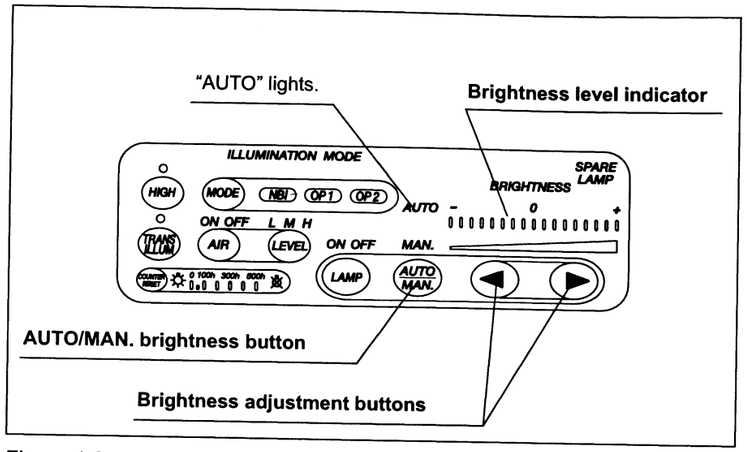


Figure 4.6

2. Press either of the brightness adjustment buttons ("◀" or "▶") to set the brightness to a level suitable for observation. The standard setting is "0".

NOTE

- The brightness indication is interlocked with the brightness level indication of the connected video system center (CV-180). When the brightness adjustment buttons on the video system center are pressed, the brightness indication on the light source varies in an interlocked operation.
- Depending on the endoscopic system being used and the part being observed, the standard setting may be too bright or too dark. In this case, adjust the brightness as needed. This can also be done during observation, if necessary.
- Pressing either of the brightness adjustment buttons ("◀" or "▶") once moves the level one step; pressing the button continuously moves the level continuously.

Manual brightness adjustment

WARNING

- Always adjust the brightness to the minimum level required for observation. Do not allow the endoscope to come in contact with a mucous membrane for a long period of time. Use of higher brightness than required may cause eye injury or burns to the tissue.
- Do not use the transillumination function while looking through the eyepiece of a fiberscope. Otherwise, the maximum light intensity may injure your eyes.

1. Press the AUTO/MAN. brightness button to select manual brightness adjustment (see Figure 4.7).

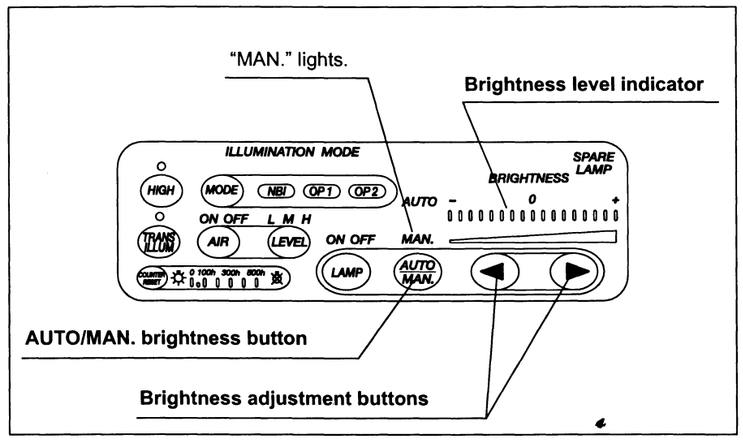


Figure 4.7

2. Press either of the brightness adjustment buttons ("◀" or "▶") to set the brightness to a level suitable for observation.

NOTE

Pressing either of the brightness adjustment buttons ("◀" or "▶") once increases or decreases the level one step; pressing the button continuously increases or decreases the level continuously.

4.5 Adjusting air/water pressure

1. Confirm that the airflow "ON" indicator lights. If not, press the airflow button (see Figure 4.8).

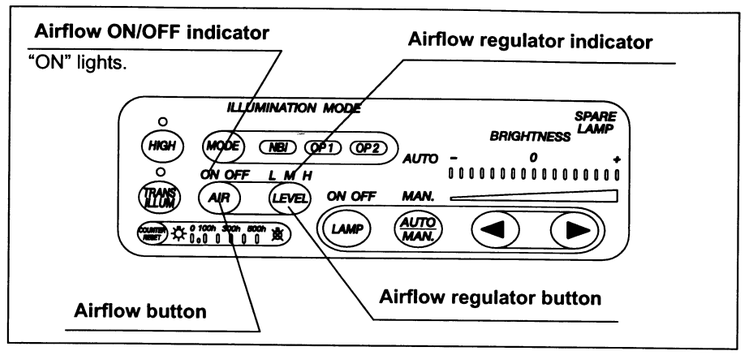


Figure 4.8

2. Press the airflow regulator button to select the "L" (Low), "M" (Medium) or "H" (High) airflow level.

NOTE

- The standard air pressure is "H" (High).
- The air and water feeding function is not available when no endoscope is connected to the light source. The function is available only when a compatible fiberscope or videoscope is connected.

3. Change the air pressure according to the examination technique or the patient's condition.
4. Feed water or air as described in the endoscope's instruction manual.
5. Pressing the airflow button stops air feeding from the light source.

NOTE

The airflow level setting is automatically stored in memory when the light source is turned OFF or the airflow button is pressed to stop the airflow. The airflow level is set to the saved level when the light source is turned ON again.

4.6 Using the transillumination function

WARNING

- Do not use the transillumination function unless absolutely necessary. Otherwise, eye injury or burns can result.
- Do not use the transillumination function while looking through the eyepiece of a fiberscope. Otherwise, the maximum light intensity may injure your eyes.

NOTE

The transillumination function is not available when no endoscope is connected to the light source. The function is available only when a compatible fiberscope or videoscope is connected.
Refer to Section 3.9, "Inspection of transillumination function" on page 41 for the compatible endoscopes.

1. Press the transillumination button. The transillumination indicator blinks and the examination light is set automatically to the maximum intensity (see Figure 4.9).

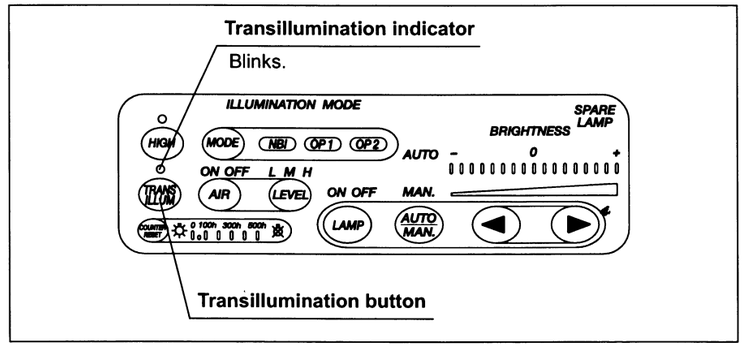


Figure 4.9

2. After about 7 seconds, the transillumination indicator is extinguished and the examination light returns to the original intensity setting. To end the transillumination before the end of the 7 second period, press the transillumination button again or press any lighted button on the control panel.

NOTE

When transillumination is returned to normal observation, it may be difficult to confirm the position of the endoscope inside the patient's body depending on the position of observation.

4.7 Using the high intensity mode

NOTE

The high intensity mode is not available when no endoscope is connected to the light source. The function is available only when a compatible endoscope is connected.
Refer to Section 3.7, "Inspection of the high intensity mode" on page 37 for the compatible endoscopes.

1. Press the intensity mode button. The high intensity mode indicator lights and the intensity of the examination light becomes automatically high (see Figure 4.10).

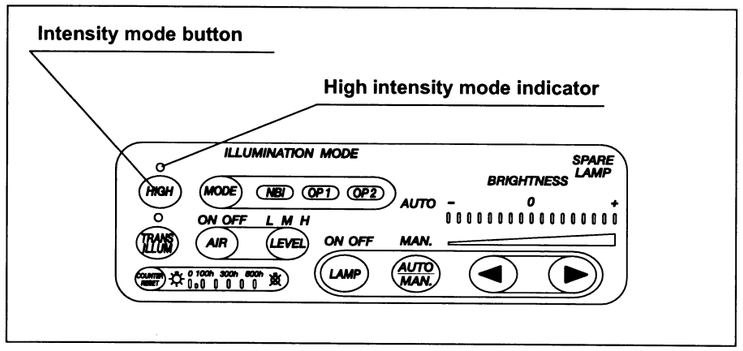


Figure 4.10

2. To engage the normal mode, press the intensity mode button again.

4.8 Using the NBI observation mode

WARNING

- If the endoscopic image seems to be dark in the NBI observation, change to the normal observation. Otherwise, an improper image may be obtained.
- Do not rely on the special light observation method alone for primary detection of lesions or for a decision regarding any potential diagnostic or therapeutic intervention.

The conditions that must be present for NBI observation are as follows:

- The video system center is connected to the light source.
- An NBI compatible endoscope is connected to the light source and the video system center.
- The video system center is ON.

All mucosal areas are to be viewed using traditional white light.
NBI imaging should not be used as a substitute for a thorough traditional examination of the mucosa.

1. Confirm that the filter mode button lights and the "NBI" indicator lights in green (see Figure 4.11).

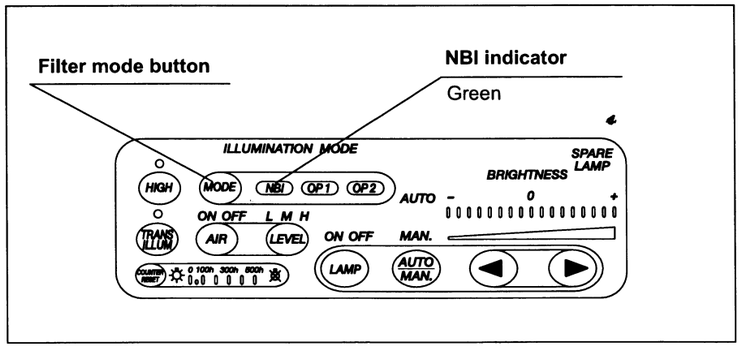


Figure 4.11

2. In Figure 4.11, normal observation is active.

3. Press the filter mode button. The color of the "NBI" indicator turns white (see Figure 4.12).

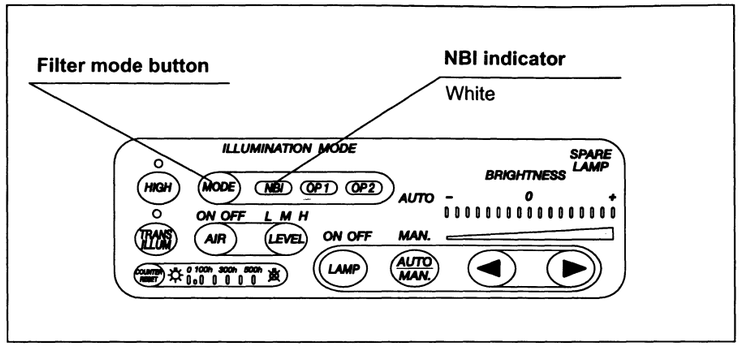


Figure 4.12

4. In Figure 4.12, NBI observation is active.

5. To return to the normal observation, press the filter mode button again. The color of the "NBI" indicator turns green.

NOTE

- An endoscope's scope switch set by the video system center enables the function as well.
- The "NBI" indicator lights in conjunction with the indicator of the video system center.

4.9 Extinguishing the examination lamp

To extinguish the examination lamp, press and hold the lamp button for one second (see Figure 4.13), or turn the light source OFF (refer to Section 4.10, "Turning the light source OFF" on page 63).

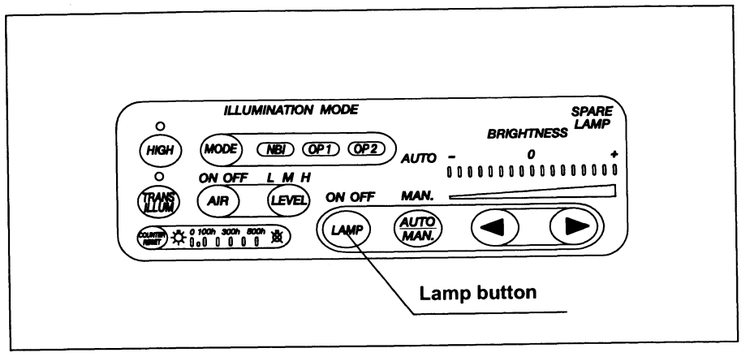


Figure 4.13

4.10 Turning the light source OFF

1. Press the power switch to turn the light source OFF. The power indicator is extinguished (see Figure 4.14).

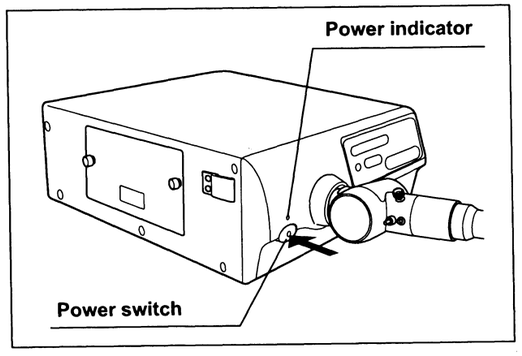


Figure 4.14

2. If the light source is not to be used for an extended period of time, disconnect the power cord.

Chapter 5 Lamp and Fuse Replacement

5.1 Replacement of the examination (xenon) lamp

Always use the examination lamp designated below. To order new examination lamp, contact Olympus.

- Xenon short-arc lamp MD-631

WARNING

- Never install a lamp that has not been approved by Olympus. The use of a non-approved lamp can cause damage to the light source and ancillary equipment, malfunction or fire.
- Turn the light source OFF and remove the power cord from the wall mains outlet before replacing the lamp with a new one. Otherwise, electric shock may result.
- Do not touch anything inside the lamp chamber. The lamp chamber is extremely hot immediately after the lamp is turned OFF.
- When replacing the lamp, do not leave any objects (such as a cloth) inside the lamp chamber. Fire and/or equipment damage can result.
- Do not apply shock, excessive force or scratches to the lamp. It could break the glass and/or shorten the lamp life due to the high internal pressure of the lamp.
- Store the hexagon wrench securely on the back side of the lamp cover. If the wrench falls inside the light source, turn OFF the light source immediately, disconnect the power cord and contact Olympus. If the light source is used while the wrench is left inside the light source, equipment damage and/or electric shock can result.
- When disposing of the used lamp, make sure to cut the projection part of the electrode on the "+" side of the examination lamp by using a nipper and discharge the internal gas (see Figure 5.1). Otherwise, the glass could break due to the high internal pressure of the lamp.

- When cutting the projection part of the electrode on the "+" side of the examination lamp, wear appropriate protection equipment at all times and be sure to cover the lamp with a cloth. Otherwise, the projection could burst and scatter in all direction, possibly causing injury. The protective equipment may include eye wear, face mask and gloves.

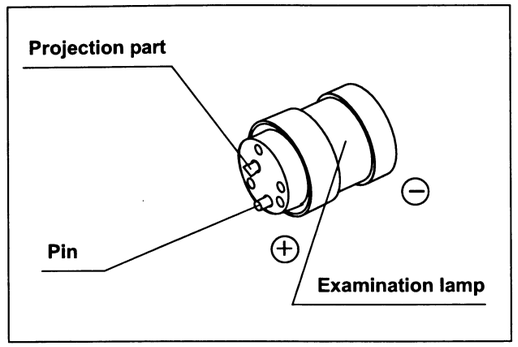


Figure 5.1

CAUTION

- Do not touch the glass surface of the lamp, filter or reflector. Natural skin moisture from your fingers can cause cracks and damage the light source.
- Handle the lamp carefully. Otherwise, the lamp may be damaged, resulting in equipment failure.
- Some examination lamps are provided with a mesh on the glass surface side (see Figure 5.2). This mesh is installed to protect the end surface of the endoscope's light guide from thermal damage and should not be removed.

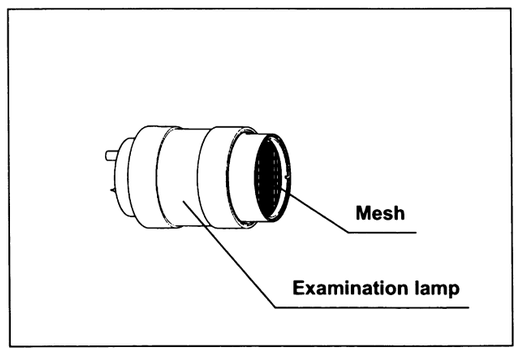


Figure 5.2

- Be sure to reset the lamp hour indicator as described in "Lamp hour indicator reset" on page 71 after replacing. Otherwise, the incorrect total working hours of the examination lamp will be indicated.

Removing the lamp

1. When the examination lamp is ON, press and hold the lamp button for about one second to extinguish it.
2. Wait a few seconds to allow the light source to cool the lamp chamber sufficiently.

NOTE

While the light source is ON and the examination lamp is extinguished, a fan built into the light source cools the lamp chamber.

3. Turn the light source OFF and disconnect the power cord.
4. Turn the knobs of the lamp cover and remove the lamp cover.
5. Confirm that the inside of the lamp chamber is not too hot.
   If the lamp chamber is extremely hot, attach the lamp cover, connect the power cord, turn the light source ON and then repeat steps 1. through 5. above.
6. Remove the hexagon wrench from the rear of the lamp cover (see Figure 5.3).

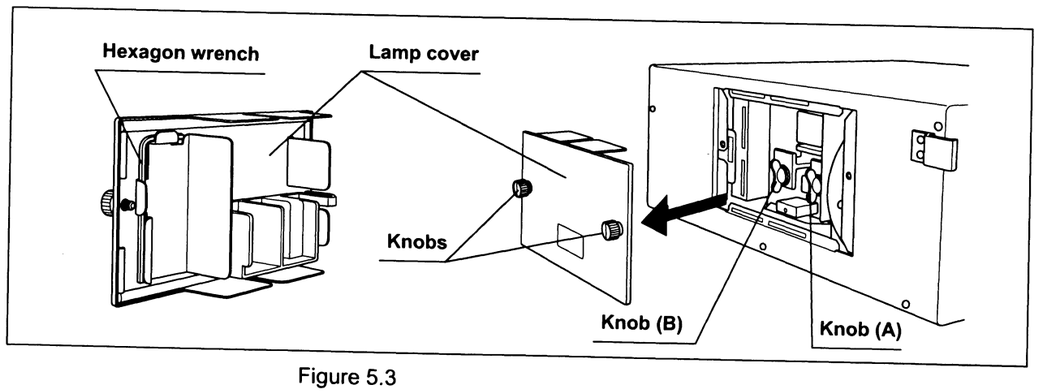


Figure 5.3

7. Turn knob (A) counterclockwise by 90° to loosen it.
8. Turn knob (B) counterclockwise by 90° to loosen it.

9. Holding the knobs or projections of the heat sinks, remove the examination lamp with heat sinks (A) and (B) attached (see Figure 5.4).

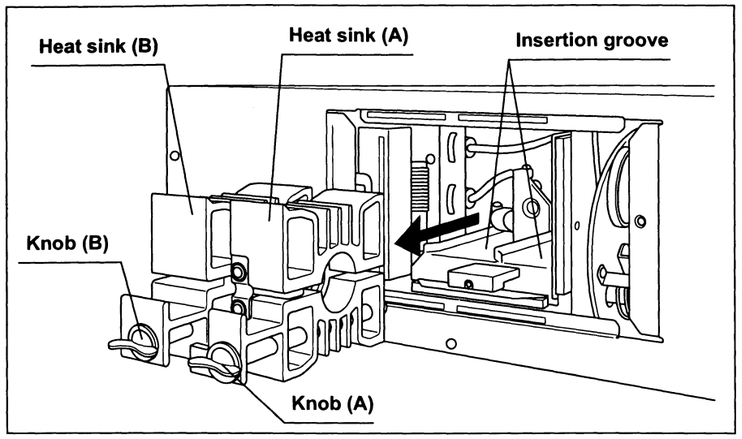


Figure 5.4

10. Using the hexagon wrench, loosen the three bolts on heat sink (B) (on the "+" side of the examination lamp or heat sink (B)) and remove heat sink (B) from the examination lamp (see Figure 5.5).

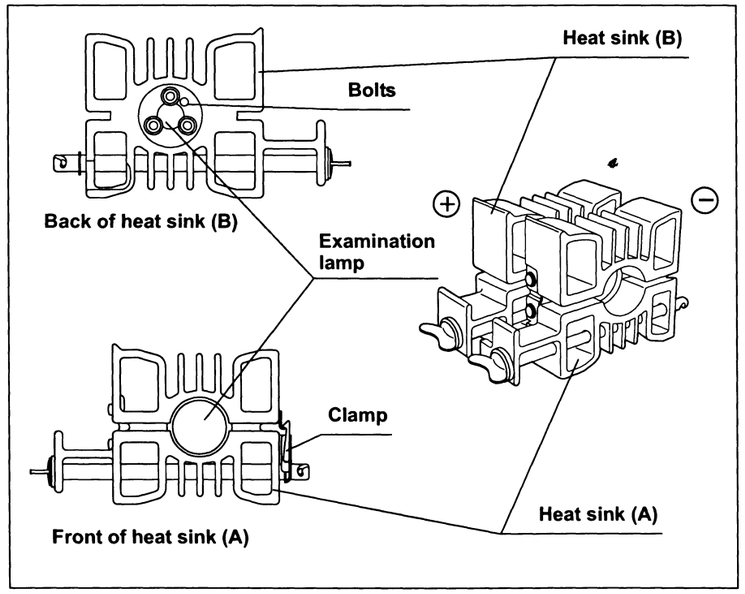


Figure 5.5

11. Remove the clamp of heat sink (A) and pull out the examination lamp.

CAUTION

When replacing the examination lamp, use a clean lint-free cloth to wipe off residual heat compound from the heat sink. If the heat compound is not wiped off completely, the lamp's heat efficiency will be impaired and the examination lamp life will be shortened significantly.

12. Using a clean lint-free cloth, wipe off any residual heat compound from the heat sink.
13. Proceed with "Inserting the lamp" below.

Inserting the lamp

1. Hold the new examination lamp without touching the glass surface.

CAUTION

- Do not apply the heat compound to the glass surface and the ceramic part of the examination lamp. If any compound gets on the glass surface, wipe it off with a clean lint-free cloth.
- Apply enough heat compound. If not enough heat compound is applied, the heat can cause lamp ignition failures.

2. Using your finger, apply the heat compound, provided with the new examination lamp thickly and evenly on the "+" side electrode of the examination lamp (see the shaded sections in Figure 5.6).

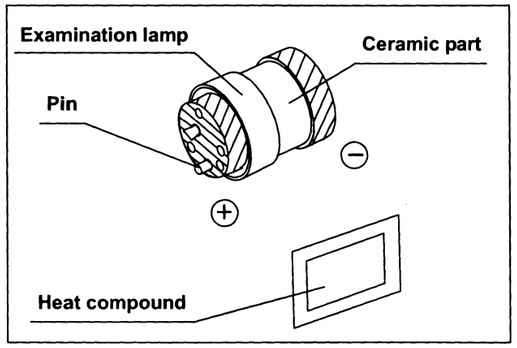


Figure 5.6

CAUTION

When inserting the examination lamp into the heat sink, align their pin positions and tighten the bolts firmly. If the bolts are not tightened firmly, poor heat radiation may result in equipment damage, examination lamp ignition failure and a considerable drop in the life of the examination lamp.

3. Insert the "+" side electrode of the examination lamp (see Figure 5.6) into heat sink (B) and tighten the three bolts firmly with the hexagon wrench.
4. Using your finger, apply the heat compound thickly and evenly on the outer periphery of the "–" side electrode of the examination lamp (see the other shaded section in Figure 5.6).
5. Insert the "–" side electrode of the examination lamp (see Figure 5.6) into heat sink (A) until it stops.

CAUTION

Be sure to tighten the heat sink clamp firmly. Otherwise, poor heat radiation may result in equipment damage, examination lamp ignition failure and a considerable drop in the life of the examination lamp.

6. Place heat sink (A) and heat sink (B) so that their undersides are flat, close the heat sink clamp firmly.
7. Insert the combination of heat sink (A) and (B) into the lamp chamber along the insertion grooves (see Figure 5.7).

CAUTION

If the heat sinks are not installed properly, their overheating may result in equipment damage or drop in the examination light brightness.

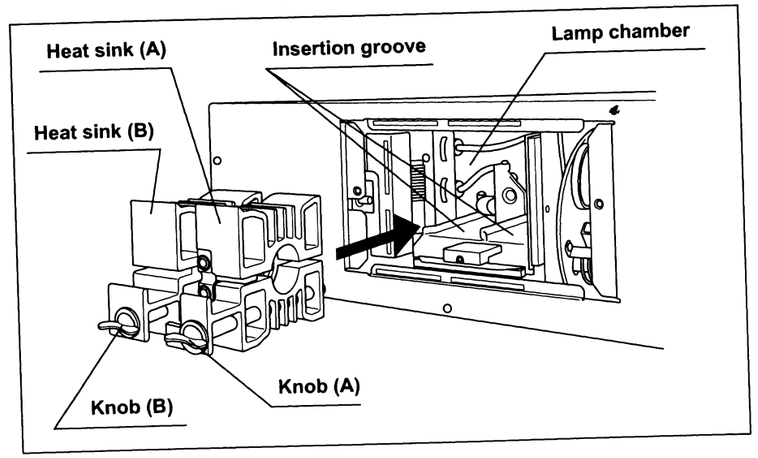


Figure 5.7

8. Turn the knob (B) clockwise by 90° from the horizontal position until it stops, while pushing the knob.
9. Turn the knob (A) clockwise by 90° from the horizontal position until it stops, while pushing the knob.

10. Confirm that the heat sinks are attached firmly by pulling the knobs (A) and (B).
11. Store the hexagon wrench back on the rear of the lamp cover (see Figure 5.8).
12. Turn the knobs of the lamp cover and close the lamp cover securely.

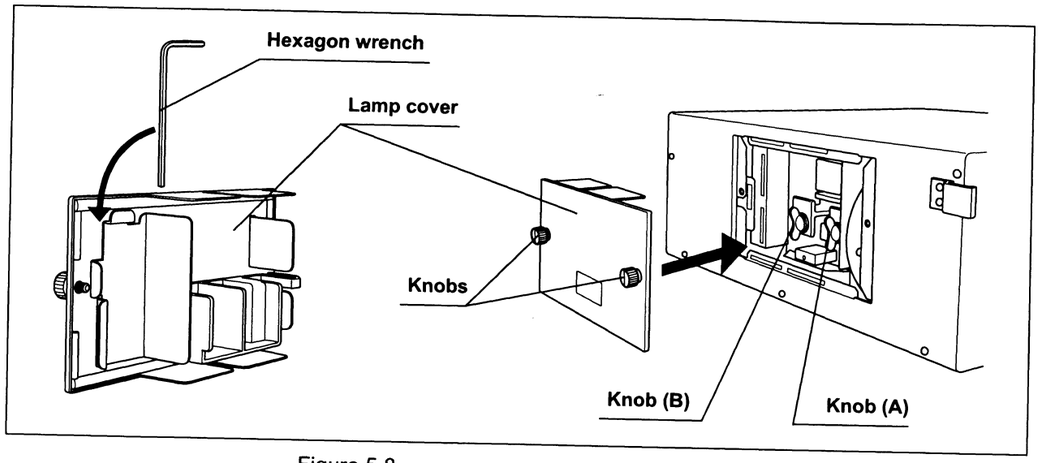


Figure 5.8

13. Proceed with "Lamp hour indicator reset" below.

Lamp hour indicator reset

CAUTION

Do not reset the lamp hour indicator unless the examination lamp is being exchanged. If the indicator is reset, it will show an incorrect total of working hours.

1. Connect the power cord and press the power switch to ON. If the examination lamp turns ON because automatic ignition was selected, press the lamp button for one second to turn it OFF.
2. Press and hold the reset button for at least 3 seconds to reset the lamp hour indicator. Confirm that the lamp hour indicator shows "0". After that, turn the light source OFF immediately (see Figure 5.9).

NOTE

The reset button is not active while the examination lamp lights. To reset the lamp hour indicator, press the button after pressing the power switch to ON but before pressing the lamp button.

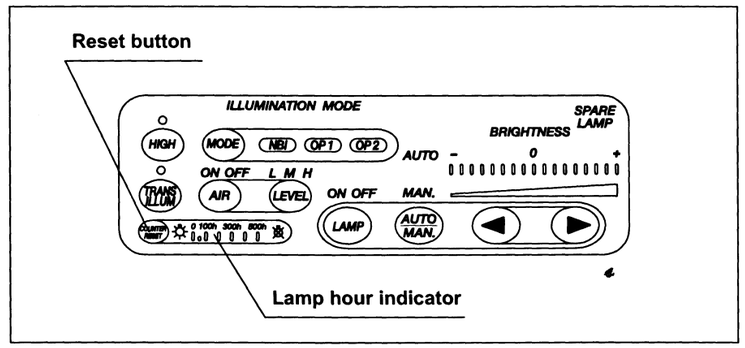


Figure 5.9

3. Inspect the light source as described in Chapter 3, "Inspection" before use.

5.2 Fuse replacement

Always use the fuses designated below. To order new fuses, please contact Olympus.

- Spare fuses MAJ-1412

WARNING

- Never use a fuse other than the fuse model designated by Olympus. Otherwise, malfunction or failure of the light source may cause a fire or electric shock hazard.
- Be sure to turn the light source OFF and unplug the power cord before removing the fuse box from the light source. Otherwise, fire or electric shock may result.
- If the power fails to come on after replacing the fuses, unplug the power cord immediately from the AC mains power inlet and then contact Olympus. Otherwise, electric shock may result.

1. Turn the light source OFF and disconnect the power cord from the wall mains outlet.
2. Pull the fuse box straight out, squeezing the tabs projected on both sides of the fuse box using a pair of tweezers (see Figure 5.10).

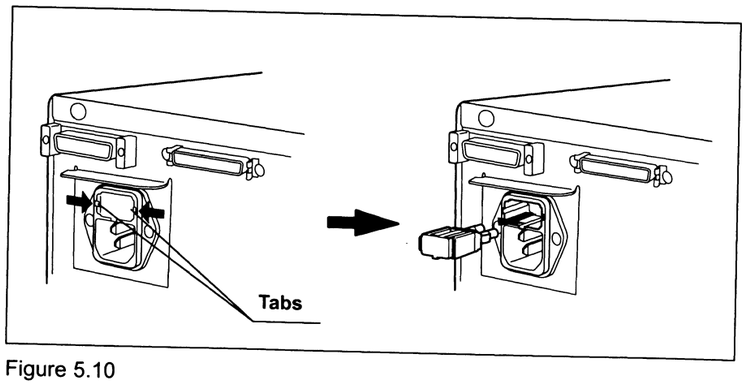


Figure 5.10

3. Replace both fuses (see Figure 5.11).

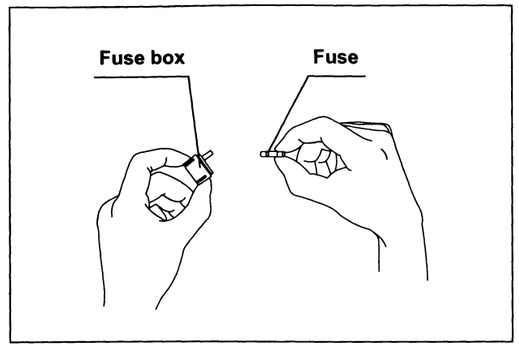


Figure 5.11

WARNING

Insert the fuse box into this instrument until it clicks into position. If the fuse box is inserted incompletely, the power may fail to come ON or the power failure may occur during operation.

4. Insert the fuse box into the light source until it clicks into position.
5. Plug the power cord and turn the light source ON and confirm the power output.

Chapter 6 Care, Storage and Disposal

6.1 Care

WARNING

- After wiping with a piece of moistened gauze, dry the light source thoroughly before using it again. If it is used while still wet, there is the risk of an electric shock.
- When cleaning the light source, always wear appropriate personal protection equipment. Blood, mucus and other potentially infectious material adhering to the light source could pose an infection control risk.
- Do not apply spray-type medical agents such as rubbing alcohol directly to the light source. Medical agents might enter the light source through the ventilation grills and may cause equipment damage.

CAUTION

- Do not clean the output socket, other connectors or the AC power inlet. Cleaning them can deform or corrode the contacts, causing damage to the light source.
- Do not autoclave or gas sterilize the light source. These methods will damage it.
- Do not wipe the external surface with hard or abrasive wiping material. The surface will be scratched.

If the light source is soiled, perform the following cleaning procedure immediately after use. If cleaning is delayed, residual organic debris will begin to solidify, and it may be difficult to effectively clean the light source. The light source should also be cleaned routinely.

1. Turn the light source OFF and disconnect the power cord.
2. Should the equipment become soiled with blood or other potentially infectious materials, first wipe off all gross debris using a neutral detergent, then wipe with a lint-free cloth moistened with a surface disinfectant.
3. Wipe the surface of the light source using a soft, lint-free cloth moistened with 70% ethyl or isopropyl alcohol to remove dust, dirt, etc.
4. Dry the light source with a clean, lint-free cloth.

6.2 Storage

CAUTION

Do not store the light source in a location exposed to direct sunlight, X-rays, radio activity or strong electromagnetic radiation (e.g. near microwave medical treatment equipment, short-wave medical treatment equipment, MRI equipment, radio or mobile phones). Damage to the light source may result.

1. Turn the light source OFF and disconnect the power cord.
2. Disconnect all ancillary equipment connected to the light source.
3. Store the equipment at room temperature in the horizontal position in a clean, dry and stable location.

6.3 Disposal

Before disposing of the examination lamp, discharge the internal gas with reference to Section 5.1, “Replacement of the examination (xenon) lamp” on page 64. Then follow all applicable national and local laws and guidelines.

When disposing of this instrument or any of its components (such as fuses), follow all applicable national and local laws and guidelines.

Chapter 7 Installation and Connection

WARNING

Review this chapter thoroughly, and prepare the instruments properly before use. If the equipment is not properly prepared before each use, equipment damage, patient and operator injury and/or fire can occur.

CAUTION

- Turn OFF all system components before connecting them. Otherwise, equipment damage or malfunction can result.
- Use appropriate cables only. Otherwise, equipment damage
- or malfunction can result.
- Properly and securely connect all cables. Otherwise, equipment damage or malfunction can result.
- The cables should not be sharply bent, pulled, twisted or crushed. Cable damage can result.
- Never apply excessive force to connectors. This could damage the connectors.
- Use this instrument only under the conditions described in "Transportation, storage and operating environments" and "Specifications" in the Appendix. Otherwise, improper performance, compromised safety and/or equipment damage may result.

Prepare the light source and compatible equipment (shown in the "System chart" in the Appendix) before each use. Referring to the instruction manuals of each system component, install and connect the equipment according to the procedure described in this chapter.

7.1 Installation work flow

Please see the installation work flow in Figure 7.1 below. Follow each step of the work flow before using the light source.

1. Install the light source and the ancillary equipment on the mobile workstation or another stable location.
→ Section 7.2, "Installation of equipment" on page 78

↓

2. Select the lamp ignition mode.
→ Section 7.3, "Selecting the lamp ignition mode" on page 81

↓

3. Install the water container.
→ Section 7.4, "Installation of the water container" on page 83
Not necessary if the air/water feeding is not used.

↓

4. Connect the light source to the video system center.
→ Section 7.5, "Connection of the video system center" on page 84
Not necessary if the video system center is not used.

↓

5. Connect the light source to the power source.
→ Section 7.6, "Connection to the AC mains power supply" on page 85

Figure 7.1

7.2 Installation of equipment

CAUTION

- Do not place any equipment other than the EVIS EXERA II video system center on the top of the light source. Otherwise, equipment damage can result.
- Keep the ventilation grills of the light source clear. The ventilation grills are located on the bottom and rear panels. Blockage can cause overheating and equipment damage.
- Clean and vacuum dust the ventilation grills using a vacuum cleaner. Otherwise, the light source may break down and gets damaged from over heating.
- Place the light source on a stable, level surface using the foot holders (MAJ-1205). Otherwise, the light source may topple down or drop, and user or patient injury may occur, or equipment damage can result.
- If a trolley other than the mobile workstation (WM-NP1 or WM-WP1) is used, confirm that the trolley can withstand the weight of the equipment installed on it.
- Do not install the light source near a source of strong magnetic wave (microwave treatment device, short wave treatment device, MRI, radio equipment, etc.). Otherwise, the video system center may malfunction.

Installation on the mobile workstation (WM-NP1, WM-WP1)

1. Place the mobile workstation on a level surface. Lock the caster brakes as shown in Figure 7.2.

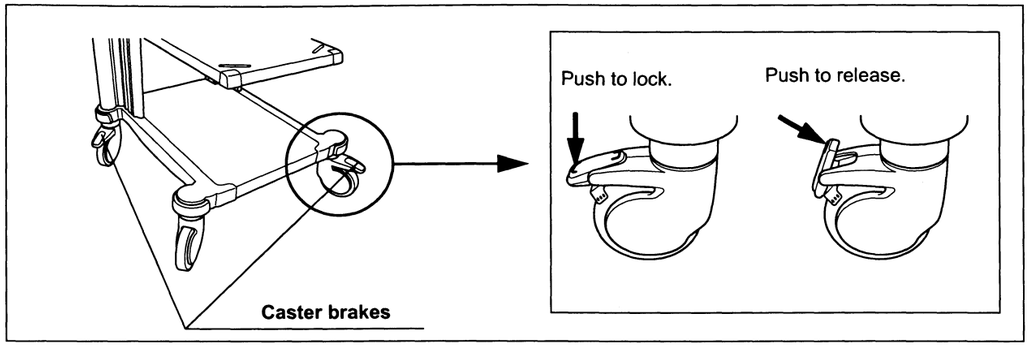


Figure 7.2

2. Install the shelf of the mobile workstation as described in the mobile workstation's instruction manual.
3. Align the two front feet of the light source with the anti-slip projections on the mobile shelf of the mobile workstation (see Figure 7.3).
4. Peel the paper from the bottom of the two provided foot holders. Place the foot holders to the two corresponding positions on the rear and attach them lightly (see Figure 7.3).

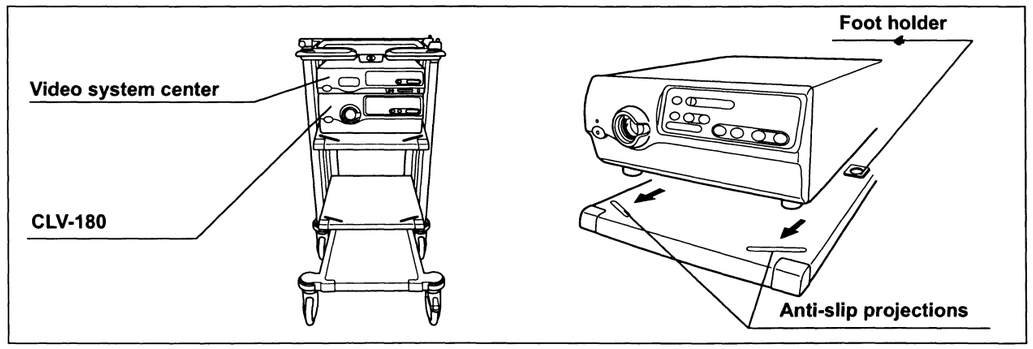


Figure 7.3

5. Remove the light source from the mobile workstation and attach the foot holders firmly.
6. Place the light source on the mobile shelf so that the rear feet fit into the foot holders.

Installation in another location

1. Place the pattern sheet provided with the foot holders on the installation location. Peel the paper from the bottom of the foot holders and lightly attach the foot holders against the sheet (see Figure 7.4).

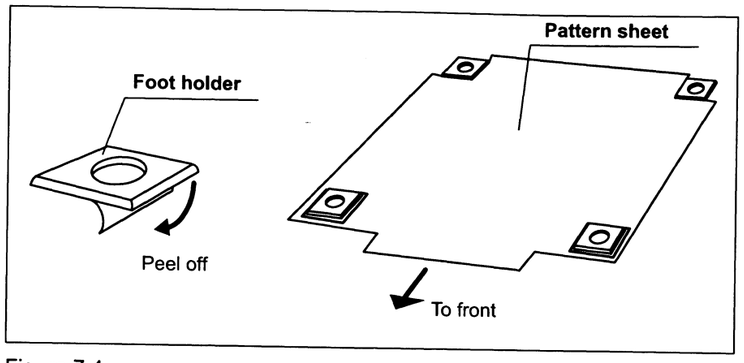


Figure 7.4

2. Place the light source on the pattern sheet and check that the feet fit into the the foot holders.
3. Remove the light source from the pattern sheet.
4. Remove the pattern sheet and attach the foot holders firmly.
5. Place the light source so that the feet of the light source fit into the foot holders.

7.3 Selecting the lamp ignition mode

Either manual or auto ignition mode is selectable to ignite the examination lamp.

- **Manual ignition**

  The mode ignites the examination lamp by pushing the lamp button after turning the light source ON.

- **Auto ignition**

  The mode ignites the examination lamp by turning the light source ON simultaneously.

Select the lamp ignition mode as follows:

NOTE

The factory default setting is the manual ignition.

O Manual ignition (MAN.)

Set the lamp ignition mode switch on the rear panel to "MAN." (see Figure 7.5).

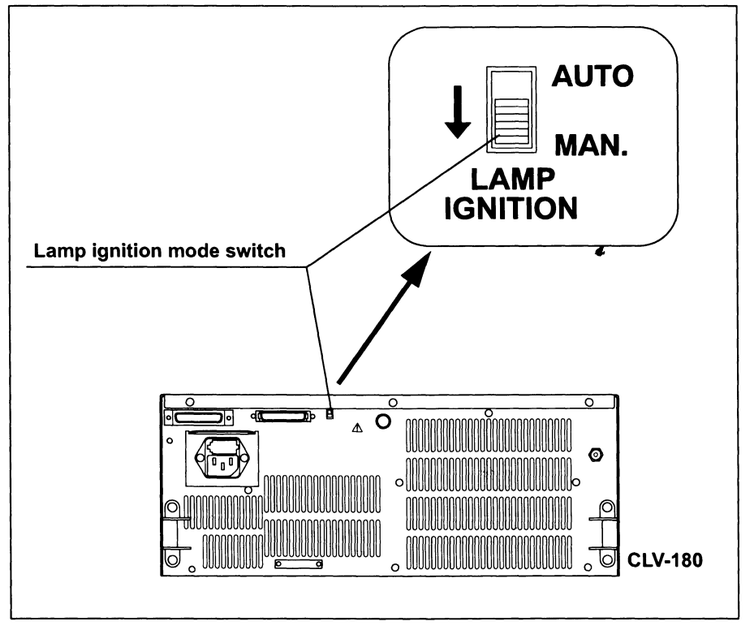


Figure 7.5

O Automatic ignition (AUTO)

Set the lamp ignition mode switch on the rear panel to "AUTO" (see Figure 7.6).

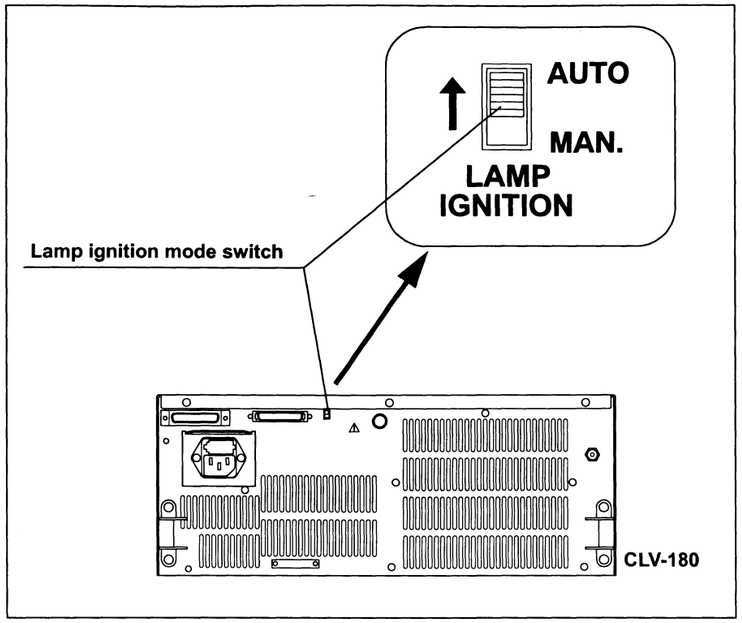


Figure 7.6

7.4 Installation of the water container

When using an endoscope used for water feeding via the light source, prepare the water container as shown in the "System chart" in the Appendix. Install the water container in the water container holder on the left side of the light source (see Figure 7.7).

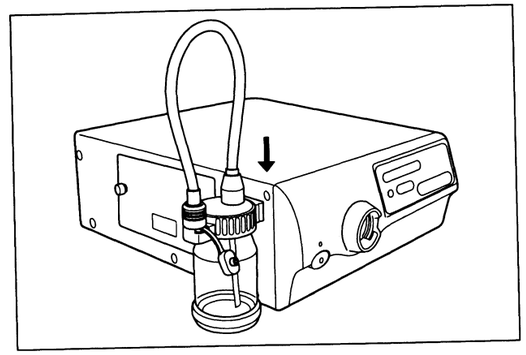


Figure 7.7

7.5 Connection of the video system center

O Compatible video system center

EVIS EXERA II video system center CV-180

For connecting the video system center (CV-180) to the light source, use the cable listed below.

Part No.	Part name	note
MAJ-1411	Light source cable	-

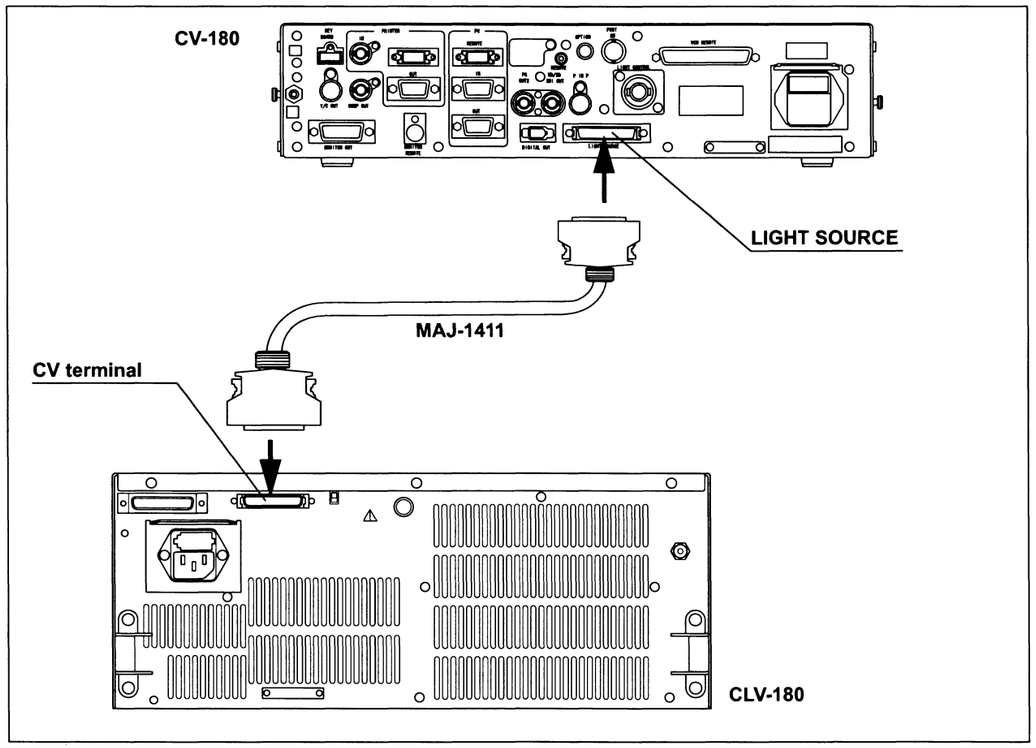


Figure 7.8

7.6 Connection to the AC mains power supply

DANGER

- Be sure to connect the power plug of the power cord directly to a grounded wall mains outlet. If the light source is not grounded properly, it can cause an electric shock and/or fire.
- Do not connect the power plug to the 2-pole power circuit with a 3-pole to 2-pole adapter. It can prevent proper grounding and cause an electric shock.

WARNING

- Always keep the power plug dry. A wet power plug may cause electric shocks.
- Confirm that the hospital-grade wall mains outlet to which this instrument is connected has adequate electrical capacity that is larger than the total power consumption of all connected equipment. If the capacity is insufficient, fire can result or the circuit breaker may trip and turn OFF this instrument and all other equipment connected to the same power circuit.
- Do not bend, pull or twist the power cord. Equipment damage including separation of the power plug and disconnection of the cord wire as well as fire or electric shock can result.
- Be sure to connect the power plug securely to prevent erroneous unplugging during use. Otherwise, the equipment will not function.
- Do not extend a single wall mains outlet into multiple outlets for connecting the power cords of both the electrosurgical unit and light source. Otherwise, malfunction of the equipment may result.

1. Confirm that the light source is OFF.
2. Connect the power cord to the AC power inlet of the light source and to the wall mains outlet (see Figure 7.9).

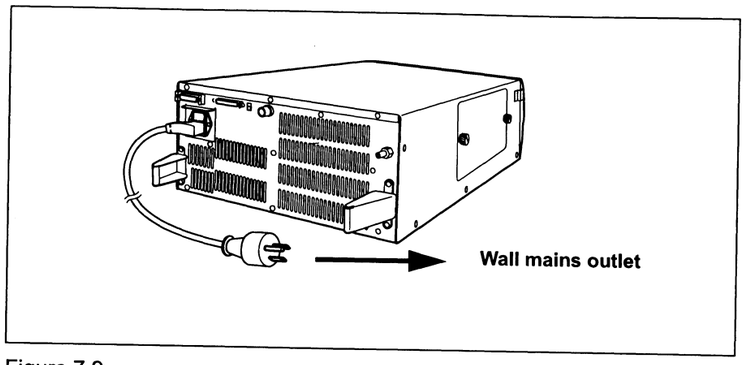


Figure 7.9

Chapter 8 Troubleshooting

If the light source is visibly damaged, does not function as expected or is found to have irregularities during the inspection described in Chapter 3, "Inspection" and Chapter 7, "Installation and Connection", or the use described in Chapter 4, "Operation", do not use the light source and contact Olympus. Some problems that appear to be malfunctions may be correctable by referring to Section 8.1, "Troubleshooting guide". If the problem cannot be resolved by the described remedial action, stop using the light source and contact Olympus

DANGER

Never use the light source if an abnormality is suspected. Damage or irregularity in the instrument may compromise patient or user safety and may result in more severe equipment damage.

8.1 Troubleshooting guide

The following table shows the possible causes of and countermeasures against troubles that may occur due to equipment setting errors or deterioration of consumable.
Troubles or failures other than those listed in the following table need repair. As repair performed by persons who are not qualified by Olympus could cause patient or user injury and/or equipment damage, be sure to contact Olympus for repair.

WARNING

If an abnormality is suspected, turn the light source OFF once and turn it ON again. If the abnormality cannot be solved, turn the light source OFF and disconnect the power cord to stop the flow of electricity completely.

Irregularity description	Possible cause	Solution
The endoscope cannot be connected to the light source.	The endoscope is not compatible with this light source.	Connect an endoscope that is listed in the "System chart" in the Appendix.
The power fails to come ON.	The power cord is not connected.	Connect to a wall mains outlet as described in Section 7.6 on page 85.
	The power switch is not turned ON.	Turn the power switch ON.
	The lamp cover is not closed.	Close the lamp cover firmly.
	The fuses have blown.	Replace both fuses with new ones as described in Section 5.2 on page 72.
The examination lamp does not ignite.	The examination lamp has not been ignited yet.	Press the lamp button.
	The examination lamp is not installed.	Install an examination lamp as described in Section 5.1 on page 64.
	The examination lamp is not installed correctly.	Reinstall the examination lamp as described in Section 5.1 on page 64.
	The examination lamp is broken.	Replace the examination lamp with a new one as described in Section 5.1 on page 64.
The examination lamp does not ignite automatically when the light source is turned ON.	The manual ignition mode is selected to ignite the examination lamp.	Set the lamp ignition mode switch on the rear panel to "AUTO".
The examination lamp ignites automatically when the light source is turned ON.	The auto ignition mode is selected to ignite the examination lamp.	Set the lamp ignition mode switch on the rear panel to "MAN.".

Irregularity description	Possible cause	Solution
The examination lamp does not turn OFF even when the lamp button is pressed.	The lamp button is pressed only for a short time.	Press and hold the lamp button for one second or more.
The examination lamp does not ignite, and the emergency lamp indicator lights.	The examination lamp is not installed.	Install an examination lamp as described in Section 5.1 on page 64.
	The examination lamp is not installed correctly.	Reinstall the examination lamp as described in Section 5.1 on page 64.
	The examination lamp is broken.	Replace the examination lamp with a new one as described in Section 5.1 on page 64.
The examination lamp does not ignite, and a beep is heard.	The temperature of the light source is too high.	Turn the light source OFF and confirm that the ventilation grills are not covered. Allow the light source to cool down, then turn it ON again.
The lamp hour indicator cannot be reset.	The examination lamp is lit.	Extinguish the examination lamp, and press and hold the reset button for 3 seconds.
	The reset button is pressed only for a short time.	Press and hold the reset button for three seconds or more.
No light is emitted from the endoscope.	The examination lamp has not been ignited yet.	Press the lamp button.
	The endoscope is not connected to the output socket.	Connect the endoscope to the output socket securely as described in Section 4.2 on page 50.
	The lamp button was accidentally pressed.	Press the lamp button again.

Irregularity description	Possible cause	Solution
The brightness level does not change even when the brightness adjustment buttons are pressed.	The level is set to the minimum or maximum.	Adjust the brightness to an optimum level as described in Section 4.4 on page 55 or turn the light source OFF then ON again.
The field of view and the image are too dark or too bright.	The examination lamp is old.	Replace the examination lamp with a new one as described in Section 5.1 on page 64.
	The emergency lamp is active.	Replace the examination lamp with a new one as described in Section 5.1 on page 64.
	The endoscope is not connected to the output socket.	Connect the endoscope to the output socket securely as described in Section 4.2 on page 50.
	The brightness level is unsuitable.	Adjust the brightness to a suitable level as described in Section 4.4 on page 55.
	Transillumination is activated. (The transillumination indicator blinks.)	Wait for auto return to the original level (in about 7 seconds) or press the transillumination button again.
	The video system center and/or light source cable is connected improperly.	Connect the video system center and light sure cable properly.
	The video system center is OFF.	Turn the video system center ON.
	NBI mode is set. (The filter mode button lights.)	Press the filter mode button to return to the normal observation mode.

Irregularity description	Possible cause	Solution
The field of view and image color are poor.	The emergency lamp is active.	Replace the examination lamp with a new one as described in Section 5.1 on page 64.
	A filter mode is set. (The filter mode indicator illuminates white.)	Press the filter mode button to return to the normal observation mode.
The air/water feeding function does not operate.	The air/water feeding function is not being operated.	Operate the air/water feeding function as described in Section 4.5 on page 58.
	The endoscope is not connected to the output socket.	Connect the endoscope to the output socket securely as described in Section 4.2 on page 50.
	The light guide is connected to the output socket.	Connect the light guide to an endoscope with air feed capability.
The transillumination function cannot be activated.	The endoscope is not connected to the output socket.	Connect the endoscope to the output socket securely as described in Section 4.2 on page 50.
	A light guide is connected to the output socket. Or an incompatible endoscope is connected to the output socket.	Connect the endoscope with the transillumination function compatibility as described in Section 3.9 on page 41.
The high intensity mode cannot be set.	An endoscope or light guide with high intensity mode compatibility is not connected to the output socket.	Connect an endoscope or light guide cable with high intensity mode compatibility as described in Section 3.7 on page 37.

Irregularity description	Possible cause	Solution
NBI observation is not enabled.	An endoscope incompatible with NBI is connected.	Connect an NBI compatible endoscope.
	The video system center is OFF.	Turn the video system center ON.
	NBI mode is not selected.	Select the NBI mode and confirm that the color of the "NBI" indicator is changed from green to white.

8.2 Returning the light source for repair

CAUTION

Olympus is not liable for any injury or damage which occurs as a result of repairs attempted by non-Olympus personnel.

When returning the light source for repair, contact Olympus. With the light source, include a description of the malfunction or damage and the name and telephone number of the individual at your location who is most familiar with the problem. Include a repair purchase order.

NOTE

If an accessory of the instrument (e.g., examination lamp, spare fuse, foot holder, power cord, light source cable) needs to be replaced, contact Olympus to purchase a replacement.

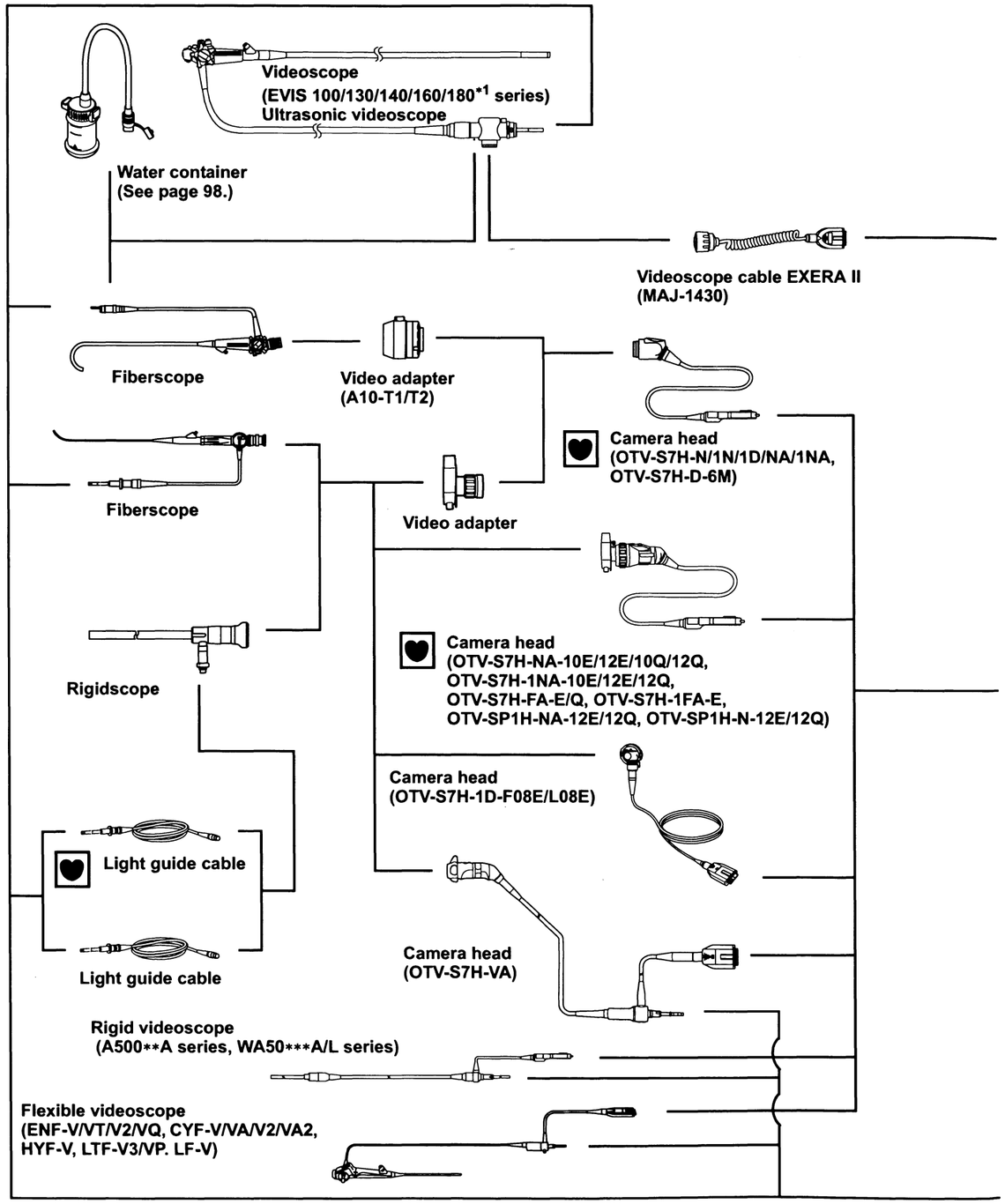
Appendix

System chart

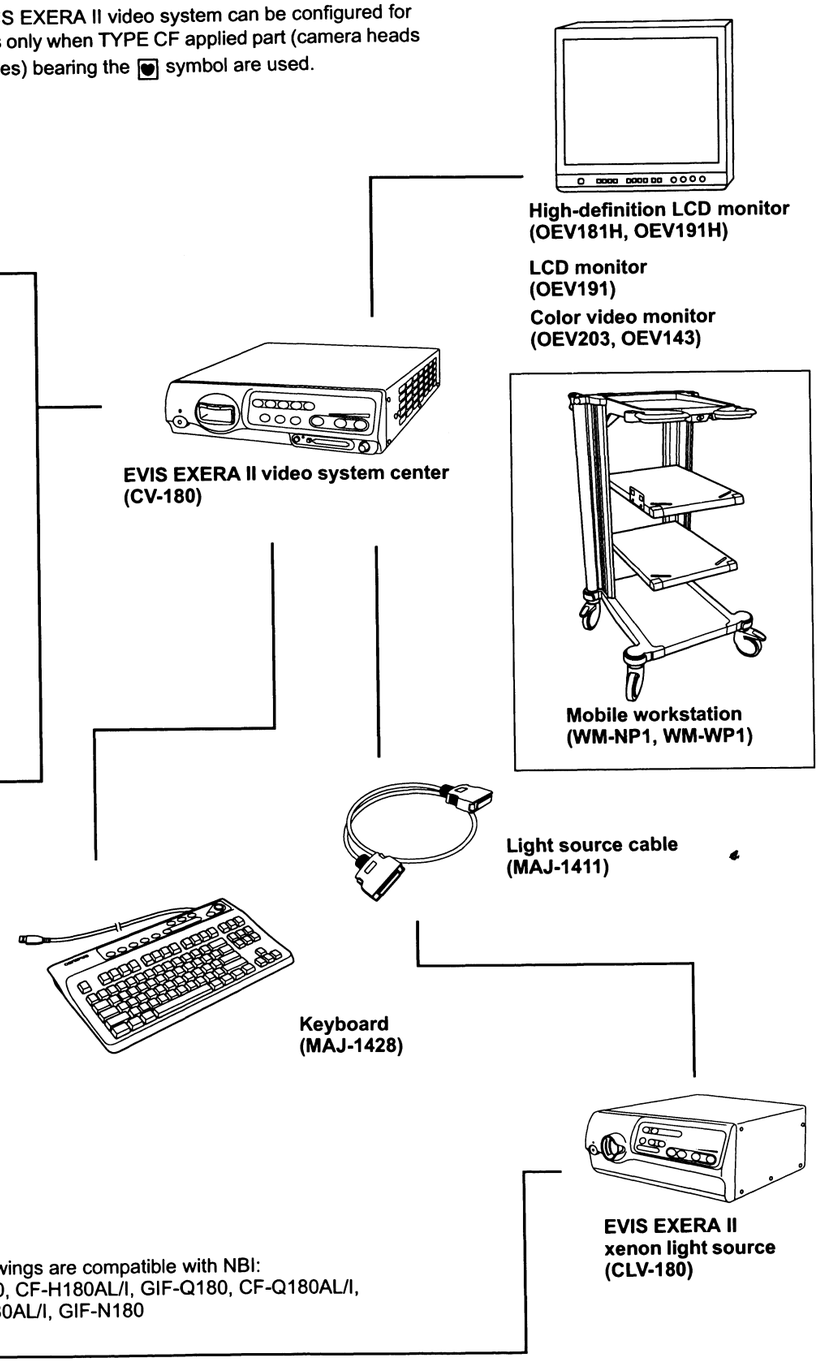
The recommended combinations of equipment and accessories that can be used with this light source are listed below. New products released after the introduction of this light source may also be compatible for use in combination with this light source. For further details, contact Olympus.

WARNING

If combinations of equipment other than those shown below are used, the full responsibility is assumed by the medical treatment facility.



The OLYMPUS EVIS EXERA II video system can be configured for cardiac applications only when TYPE CF applied part (camera heads and light guide cables) bearing the ♥ symbol are used.



*1 The followings are compatible with NBI:
GIF-H180, CF-H180AL/I, GIF-Q180, CF-Q180AL/I,
PCF-Q180AL/I, GIF-N180

❍ Water container

BF endoscopes do not use the water container.

Endoscope	Water container					
	MAJ-901	MAJ-902	MH-884	MH-970	MD-431	MA-995
EVIS EXERA II 180 series	O	O	O	O	–	–
EVIS EXERA 160 series, Ultrasonic videoscope 160 series	O	O	O	O	–	–
EVIS 140 series, Ultrasonic videoscope 140 series	O	O	O	O	–	–
EVIS 100, 130 series, Ultrasonic videoscope 130 series	–	–	–	–	O	O
OES 40 series	O	O	O	O	–	–
OES 10, 20, 30, E, E3 series	–	–	–	–	O	O

O: applicable, –: not applicable

Transportation, storage and operating environments

Transportation and storage environment	Ambient temperature	–25 to +70°C (–13 to + 158°F)
	Relative humidity	10 - 90%
Operating environment	Ambient temperature	10 - 40°C (50 - 104°F)
	Relative humidity	30 - 85% (without condensation)
	Atmospheric pressure	700 - 1060 hPa (0.7 - 1.1 kgf/cm^2) (10.2 - 15.4 psia)

Specifications

Item		Specification
Power supply	Voltage	100 - 240 V AC
	Voltage fluctuation	Within ± 10%
	Frequency	50/60 Hz
	Frequency fluctuation	Within ± 1 Hz
	Consumption electric power	500 VA
	Fuse rating	8 A, 250 V
	Fuse size	ø5 × 20 mm
Size	Dimensions	383 (W) × 162 (H) × 536 (D) mm (maximum)
	Weight	15.4 kg
Illumination	Examination lamp	Xenon short-arc lamp (ozone-free) 300 W
	Average lamp life	Approximately 500 hours of continuous use (With intermittent use, the lamp life may vary slightly.)
	Ignition method	Switching regulator
	Brightness adjustment	Light-path diaphragm control
	Intensity mode	Normal or high intensity
	Cooling	Forced-air cooling
	Color conversion	Possible using special-purpose filter.
	Emergency lamp	Halogen lamp (within mirror) 12 V 35 W
	Average emergency lamp life	Approximately 500 hours
Automatic brightness control	Automatic brightness control method	Servo-diaphragm method
	Automatic exposure	17 steps
Air feeding	Pump	Diaphragm type pump
	Pressure switching	4-level available (OFF, low, medium, high)
Water feeding	Method	Air pressurization or detachable water container

Item		Specification
Indicators on front panel	**Emergency lamp**	It reports absence of emergency lamp, disconnection and use of emergency lamp.
	NBI	It lights in green under the normal observation and lights in white under the NBI observation.
	OP.1	It lights if a special filter is installed into the light source.
	OP.2	It lights if a special filter is installed into the light source.
Setting memory		Settings (except filter setting) are stored even when the light source is OFF.
Classification (medical electrical equipment)	**Type of protection against electric shock**	Class I
	Degree of protection against electric shock of applied part	Depend on applied part See also applied part (Camera head or videoscope).
	Degree of protection against explosion	This instrument should be kept away from flammable gases.
Medical Devices Directive	CE 0197	This device complies with the requirements of Directive 93/42/EEC concerning medical devices. Classification: Class II a
WEEE Directive		In accordance with European Directive 2002/96/EC on Waste Electrical and Electronic Equipment, this symbol indicates that the product must not be disposed of as unsorted municipal waste, but should be collected separately. Refer to your local Olympus distributor for return and/or collection systems available in your country.

Item		Specification
EMC	**Applied standards; IEC 60601-1-2: 2001**	This instrument complies with the standards listed in the left column. CISPR 11 of emission: Group 1, Class B This instrument complies with the EMC standard for medical electrical equipment; edition 2 (IEC 60601-1-2: 2001). However, when connecting to an instrument that complies with the EMC standard for medical electrical equipment; edition 1 (IEC 60601-1-2: 1993), the whole system complies with edition 1.
Year of manufacture	**7612345** ↑	The last digit of the year of manufacture is the second digit of the serial number.

EMC information

This model is intended for use in the electromagnetic environments specified below. The user and the medical staff should ensure that it is used only in these environments.

O Magnetic emission compliance information and recommended electromagnetic environments

Emission standard	Compliance	Guidance
RF emissions CISPR 11	Group 1	This instrument uses RF (Radio Frequency) energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	This instrument's RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
Main terminal conducted emissions CISPR 11		
Harmonic emissions IEC 61000-3-2	Class A	This instrument's harmonic emissions are low and are not likely to cause any problem in the typical commercial power supply connected to this instrument.
Voltage fluctuations/flicker emissions IEC 61000-3-3	Complies	This instrument stabilizes own radio variability and has no affect such as flicker of a lighting apparatus.

O Electromagnetic immunity compliance information and recommended electromagnetic environments

Immunity test	IEC 60601-1-2 test level	Compliance level	Guidance
Electrostatic discharge (ESD) IEC 61000-4-2	Contact: ± 2, ± 4, ± 6 kV Air: ± 2, ± 4, ± 8 kV	Same as left	Floors should by be made of wood, concrete, or ceramic tile that hardly produces static. If floors are covered with synthetic material that tends to produce static, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/output lines	Same as left	Mains power quality should be that of a typical commercial (original condition feeding the facilities) or hospital environment.
Surge IEC 61000-4-5	Differential mode: ± 0.5, ± 1 kV Common mode: ± 0.5, ± 1, ± 2 kV	Same as left	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	< 5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles < 5% U_T (>95% dip in U_T) for 5 seconds	Same as left	Mains power quality should be that of a typical commercial or hospital environment. If the user of this instrument required continued operation during power mains interruptions, it is recommended that this instrument be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	Same as left	It is recommended to use this instrument by maintaining enough distance from any equipment that operates with high current.

NOTE

U_T is the a.c. mains power supply prior to application of the test level.

O Cautions and recommended electromagnetic environment regarding portable and mobile RF communications equipment such as a cellular phones

Immunity test	IEC 60601-1-2 test level	Compliance level	Guidance
Conducted RF IEC 61000-4-6	3 V_{rms} (150 kHz - 80 MHz)	3 V (V_1)	Formula for recommended separation distance (V_1=3 according to the compliance level) $d = \left[\frac{3.5}{V_1}\right]\sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m (80 MHz - 2.5 GHz)	3 V/m (E_1)	Formula for recommended separation distance (E_1=3 according to the compliance level) $d = \left[\frac{3.5}{E_1}\right]\sqrt{P}$ 80 MHz to 800 MHz $d = \left[\frac{7}{E_1}\right]\sqrt{P}$ 800 MHz to 2.5 GHz

NOTE

- Where "P" is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and "d" is the recommended separation distance in meters (m).
- This instrument complies with the requirements of IEC 60601-1-2: 2001. However, under electromagnetic environment that exceeds its noise level, electromagnetic interference may occur on this instrument.
- Electromagnetic interference may occur on this instrument near a high-frequency electrosurgical equipment and/or other equipment marked with the following symbol:

O Recommended separation distance between portable and mobile RF communications equipment and this instrument

Rated maximum output power of transmitter P (W)	Separation distance according to frequency of transmitter (m) (Calculated as V_1=3 and E_1=3)		
	150 kHz - 80 MHz $d = 1.2\sqrt{P}$	80 MHz - 800 MHz $d = 1.2\sqrt{P}$	800 MHz - 2.5 GHz $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

NOTE

The guidance may not apply in some situations.
Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.
Portable and mobile RF communications equipment such as cellular phones should be used no closer to any part of this instrument, including cables than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.

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